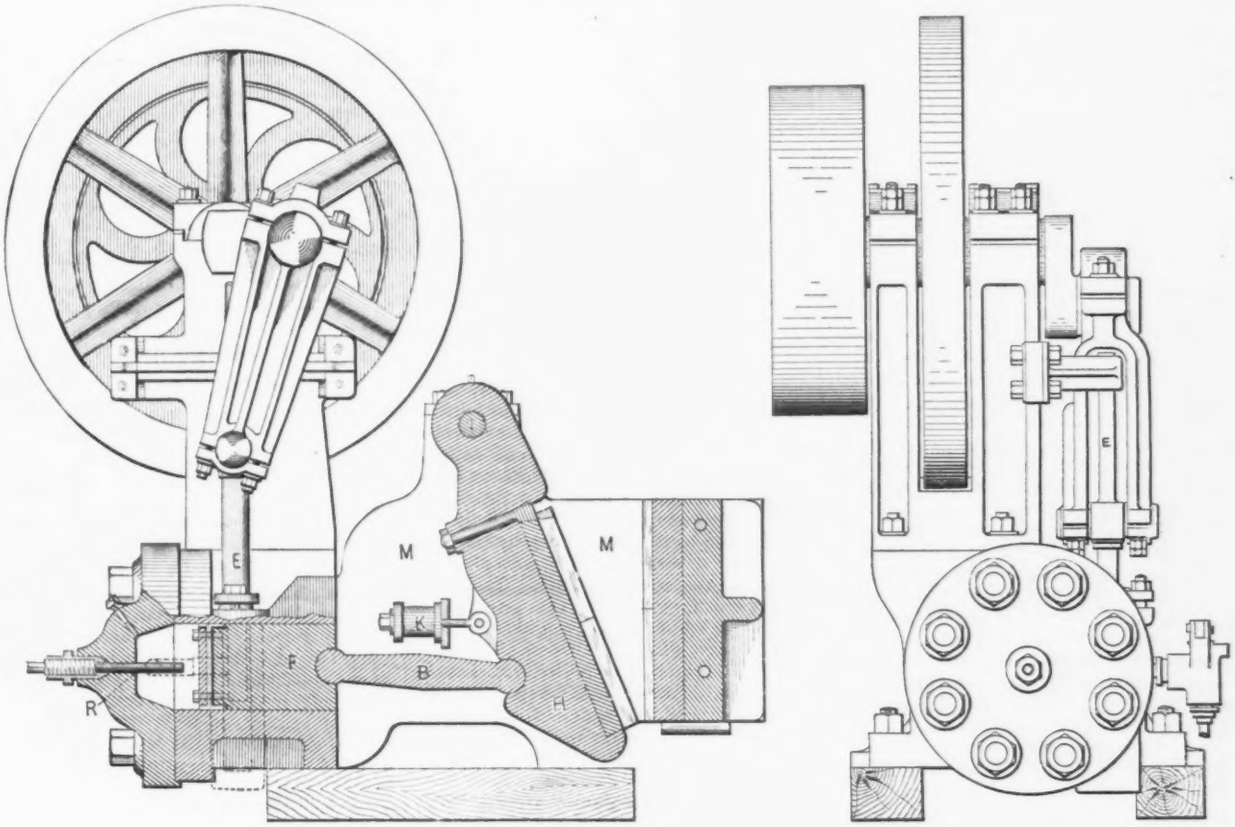
THE IRON AGE

THURSDAY, FEBRUARY 25, 1892.

The Smith Hydraulic Safety Stone Crusher.

The principal feature underlying the construction of the stone crusher of which drawings are here presented is the displacement of water in the cylinder by an entering plunger, the piston in the cylinder thereby being forced out and the movable jaw of the crusher operated. It is evident at the start that this construction by reducing the parts, and particularly by doing away with much of the friction always present in machines of ordinary construction, not only reduces the wear and tear, but also decreases the amount of power required to operate the machine. Our views show the machine in section and in end elevation. Attached to the wrist pin of the crank on the driving shaft is a connecting rod, to the lower end of which is attached the upper end of the plunger E, which is arranged to work through suitable stuffing boxes in a cylinder having connection with and placed at one side of the main operating cylinder, as shown in the end view. It is apparent that if the main cylinder and the hydraulic cylinder be filled with water and the plunger then be forced down the displacement resulting will cause a forward movement of the piston F, and through the strut B a forward movement also of the jaw H of the crusher. Upon the plunger E being withdrawn by the upward stroke of the crank, the movable jaw is drawn back or toward the left in position for a new stroke by means of a spring placed in the casing K. The screw R serves to regulate the opening of the lower edges of the jaws of the crusher. It is evident that the stroke remains unchanged, since the displacement caused by the plunger is always the same, and, therefore, no matter what position the piston F may occupy in its cylinder the jaw H will move a certain specified distance, which is always the same. If it is desired to increase the space separating the lower parts of the jaws the screw R is withdrawn, when the plunger F is then brought back by means of the spring K until its inner end strikes the end of the screw entering the cylinder and it is then ready for its forward stroke. A suitable by pass allows the water in the cylinder to accommodate itself to these varying conditions. Since the diameter of the plunger is very small in comparison with the diameter of the piston, and since the stroke of the plunger is long as compared with the stroke of the movable jaw, there is a great increase in leverage brought to bear on the material passing through the jaws, when we take into consideration the amount of pressure per square inch exerted by the plunger. A safety valve is provided, in order that should any material, like a lump of iron, drop between the jaws the water will be allowed to escape before the machine is broken. By regulating the screw R so that the jaws will attain the proper distance required, any degree of fineness can be obtained in the crushed product. This machine is placed on the market by the Case & Redfield Machinery Company, 16 Court street, Brooklyn, N. Y.



Vertical Section. *End Elevation.*

THE SMITH HYDRAULIC SAFETY STONE CRUSHER.

Electro Aluminum-Plating on a Grand Scale.

The vast difference separating the electro deposition of metal upon an article the size of a spoon and doing the same work on the exterior surface of a building of massive proportions can be readily appreciated. The difficulties encountered in electroplating pieces of large size are far greater in proportion than when the work is applied to specimens of insignificant dimensions. It is, therefore, conceivable that when a concern is ready to undertake the contract to plate electrically a surface of material amounting in the aggregate to nearly 100,000 square feet they must be confident of their own ability to successfully carry out the work, and must impart a like confidence to those for whom the work is to be done.

And yet this is precisely what is now being carried on by the Tacony Iron and Metal Company at Tacony, Philadelphia. This establishment has the contract for plating the upper part of the tower of the Philadelphia Public Buildings. The unusual part of the work is to be found not only in the great size of the separate pieces to be handled, but also in the material with which it is intended to cover the entire exterior. This, we believe, is the first case of any magnitude whatever in which an attempt has been made to plate iron with aluminum. The tower is now finished for a distance of 335 feet from the ground, and from that point the remainder to a hight of 548 feet from the ground,

or 213 feet additional, will consist of an exterior of cast iron conforming in its architectural aspects with the lower stone portion and supported by an interior frame work of iron. The first story of the iron portion, the one immediately above the masonry part, will contain the clock faces, one face being upon each of the four sides. The frame work for this story is already in place, and the iron exterior has been fitted and assembled and dismantled, and only awaits plating with aluminum before final erection.

A recent visit of a representative of *The Iron Age* to the works of the Tacony Iron and Metal Company showed that extensive preparations had been made in order to successfully carry out this work. A large building has been erected, at the entrance of which one first sees six long tanks arranged in two rows of three each, and running down one side of the building. These tanks are made of yellow pine and measure 26 feet long by 8 feet deep and about 5 feet wide, and in them all the operations of preparing and plating the different members of the structure will be carried on. To illustrate the method pursued, we will suppose that a column of cast iron is to be plated with aluminum. At its entrance into the building it is attached to an overhead trolley, running on a track extending parallel with the first row of tanks, or the one next the wall of the building In these tanks it is cleansed and brought to the proper condition, and at the end is taken by a cross track where it enters the first tank of the second row. In this the final work of preparing the column is accomplished, and in the next tank, or the fifth from the start, the metal is electrically deposited. The final or sixth tank performs the washing operation, after which the column is taken from the building.

Each tank rests in a separate or independent cement pit, the top of which is on a level with the floor, which is also cemented and properly inclined so as to drain well, and in the cement pit so formed the wooden tank is placed. The pit is then filled with water, this construction being followed in order that the pressure of water upon the inside of the wooden tank may be counterbalanced by water pressure upon the exterior. Any shape can be handled, and any dimension that will go in the tank, or that is not over 26 x 5 x 8 feet, can be plated. The plating will consist of pure aluminum placed directly on the iron. We were informed by H. C. Forest, the vice-president and secretary of the company, that they were now prepared to deposit any metal upon any other metal, provided the sizes were not too large to go in their tanks. An extended series of experiments which have been carried on at the works have shown that it is possible to plate economically with aluminum directly on the iron or to plate with the aluminum on a first deposit of copper. On the other side of the building are the several tools necessary for carrying on work of this character, and at one end is the electrical apparatus, which is being installed by the Zucker & Levett Chemical Company of New York.

Bronze Casting.

The tower will be surmounted by a bronze statue of William Penn and at the base of the dome will be four bronze groups of the Indian and the early settlers. The statue of Penn is one of the largest ever cast, it measuring 38 feet in hight and containing 50,000 pounds of bronze. It was cast in sections averaging about $\frac{1}{4}$ inch in thickness. The edges of the several pieces were cast with flanges projecting toward the interior and through these flanges pass bolts holding the parts firmly in place. The method of molding this statue was similar to that described in former issues of *The Iron Age*.

Random Shop Notes.

Thin Iron Castings of Unusual Size.

The Tacony Iron and Metal Company of Tacony, Philadelphia, now have the contract, which they are pushing rapidly toward completion, for furnishing the window frames for the new Congressional library building. These frames are built entirely of thin cast iron, the inside and outside moldings, the sash guides, sills and lintels all being of this material. Upon examining the work in progress we first noticed in one frame which we saw, measuring 18 feet high by 7 feet wide, the perfection of the joints. It will be understood that these casings are built up of many pieces of thin castings, and that the joints, both miter and square, occur very frequently, and yet it is not exaggeration to say that the workmanship here exhibited would compare most favorably with the same work had it been executed in wood. We were informed that they had made castings of iron 17 feet long, 54 inches wide, and which were not more than $\frac{5}{16}$ inch thick in any part. These castings are of course not plane, being so molded as to conform with the outline called for by the architect's specifications. This work requires, in order that the proper degree of perfection shall be obtained, that the several parts shall be straight on the abutting edges and also that the miters and squares at the joints shall be straight and true. Two appliances which have been designed at the works are used to facilitate this operation, insure accuracy, and, above all, do away with the slow and expensive method of hand-chipping. In trimming down a beveled joint the piece whose end is to be beveled is secured at the proper angle on a bed which has a to and fro motion across the face of an emery wheel. The work can thus be fed to the wheel, thereby insuring not only a straight edge but also the proper degree, if it is a miter. The other machine is intended for the grinding of long edges which it is essential to make perfectly straight. In this case the piece to be straightened is bolted so that the edge to be operated upon hangs over the immovable bed to which it is secured. An emery wheel is then made to travel up and down in front of the work until the proper degree of accuracy has been attained. These machines have been found to serve their purpose admirably, and to do away with the noise and inconvenience resulting from chipping, and most essentially, to produce better work. Through the courtesy of the company we trust shortly to present an illustrated description of what we may term the straight-edge grinding machine. The foundry of this company measures 200 x 140 feet, is equipped with cranes and all appliances for the handling of flasks and castings, and has a melting capacity of 32,000 pounds per hour.

Emery Wheels for Tool Grinding.

Recently passing through the shops of Pedrick & Ayer, in Philadelphia, it was noticed that their centrifugal emery wheel tool grinders were distributed quite frequently through the several floors, and the question was asked as to what governed their location and also their number. It was stated in reply that they had found it economical in time to place one machine within convenient reach of every eight men, this distribution being affected under the supposition that it was better economy to place the machines so as to be easily reached than it was to distrioute them less frequently, and, therefore, not only make the workmen go further, but also making them run the risk of reaching the machine and finding it already doing work for some one else. In the distribution they follow, placing several machines on a floor, one to every eight men, they had found that it resulted in increased economy even when they considered the wear and tear in the machine itself, the cost of driving it and the interest on first investment.

Working quietly in one corner of the shop we noticed a Millers Falls hack saw quietly cutting its way through a 4-inch steel bar. This saw, as perhaps most of our readers are aware, consists simply of a large hack saw arranged so as to be driven by a pitman from a crank driven by a belt from the main shaft. It was stated that the saw did its work well, although, of course, it was very slow in operation compared with saws of greater power, and that it had one advantage, inasmuch as the kerf was very small, not exceeding $\frac{3}{32}$ inch, as compared with the kerf made by the ordinary cold saw arranged for doing the same kind of work, which would be at least $\frac{1}{4}$ inch.

The Biggest Lathe in the World.

William Sellers & Co., Incorporated, of Philadelphia, have just completed the first lathe called for in their contract with the Government, intended for the turning and boring of 16 inch guns. This lathe is probably the largest ever constructed, and embodies the best practice possible in design, material and workmanship. The lathe weighs 500,000 pounds and has a total length of 133 feet. Its greatest hight is 12 feet, greatest width 10½ feet and its cost $76,000. This is the first of seven lathes to be built for the Washington Navy Yard. Some idea of the great magnitude of the tool may be had from the fact that the cast-steel face plate weighs 16,000 pounds and is provided with four adjustable steel jaws, and with a gear having 75 teeth of 4 inch pitch and 10½ inch face. The lathe will have 14 speeds, ranging in geometrical ratio from four-tenths of a revolution to four and three-tenths revolutions per minute. The bed of the lathe proper is of cast iron, 79 feet 10¾ inches long, with a depth of 9 feet. This is formed with four ways, two of which carry the tool carriage on one side, while the other two support the steady rests and tailstock. The boring arrangement, or what we might term the tail extension of the lathe, is provided with a 6 inch steel screw 62 feet in length. All the other parts of the lathe are built upon the same generous scale. The face plate, of cast steel, was made by the Solid Steel Company of Alliance, Ohio.

Mexico has reason for renewed confidence in the United States, now that a committee of the Senate has reported adversely to hearing any propositions for the annexation of a slice of territory from the Northern States of Mexico, such as is supposed to be favored by Garcia and his adherents who are raiding the valley of the Rio Grande. This action is in accordance with the views of the present Secretary of State, who two years ago held "that the Government of the United States is precluded by obligations of traditional good faith from approaching the Government of Mexico with a view to acquiring any part of the Mexican territory."

Secretary Foster is opposed to the transfer of the revenue marine service to the Navy Department. He says: "The department which collects the major portion of the revenue for the support of the Government should have complete and undoubted control of the instrumentalities for its collection."

The Mining Engineers.

The Meeting at Baltimore.

The annual meeting of the American Institute of Mining Engineers was opened at Levering Hall, Baltimore, by James W. Tyson, chairman of the Local Committee, by introducing Mayor Latrobe, who pronounced the welcome to Maryland, cordially supported by President D. C. Gilman of Johns Hopkins University. After a suitable response by John Birkinbine, president of the institute, the secretary, Dr. R. W. Raymond, read obituary notices of Edward Nichols, the late president of the Brooks Locomotive Works, and of Dr. T. Sterry Hunt, the eminent chemist and geologist.

The meeting was largely attended, among those present being: Dr. David T. Day of the United States Geological Survey, E. C. Pechin of Roanoke, Va.; C. H. Roney, J. W. Cabot, E. V. D'Invilliers, J. F. Wilcox of the Pittsburgh Engineering Company, Pittsburgh; David Baker of the Maryland Steel Company, W. M. Jolliffe, Buchanan; R. M. Blankenslip of the Old Dominion Works, Richmond, Va.; T. Egleston, S. Stutz of Pittsburgh, W. H. Wiley of New York, American correspondent of London *Engineering;* E. S. Cook, president of the Warwick Iron Company, Pottstown, Pa.; W. H. Morris of the Pottstown Iron Company, Pottstown, Pa.; Harvey S. McLeod of Troy, N. Y.; N. G. Roberts of Sparrow's Point, Md.; A. S. McCreath, the well-known chemist, of Harrisburg; Chas. E. Billin and G. F. Knapp of the Pennsylvania Steel Company, Steelton, Pa.; W. H. Hoffman of the Croton mines, Brewsters, N. Y.; R. P. Patterson, Philadelphia; James Gayley of the Edgar Thomson furnaces, Braddock, Pa.; J. D. Weeks, Pittsburgh, Pa.; H. W. Lash, general manager of the Carbon Iron Company, Pittsburgh; Burdette Loomis, Hartford, Conn.; S. G. Valentine of the Colebrook Furnaces, Lebanon, Pa.; H. McCormick, Jr., of Harrisburg; Jos. Hartshorne, manager of the basic plant of the Pottstown Iron Company, Pottstown; F. E. Bachman, manager of the Salem Furnace, Salem, Va.; F. B. Richards, manager of the Buena Vista Furnace, Buena Vista, Va.; W. B. Cogswell of the Solvay Process Company, Syracuse, N. Y.; Gus. C. Henning of New York; W. E. Coxe of Reading, Pa.; Oberlin Smith, Ferracute Machine Company, Bridgeton, N. J.; Chas. M. Schwab, general manager of the Edgar Thomson Steel Works; W. Burnham and W. Nelson of Philadelphia, S. H. Chauvenet, until recently general manager of the Virginia Development Company; S. T. Wellman, Wellman Iron and Steel Company, Thurlow, Pa.; H. M. Howe, Boston, Mass.; Spencer Miller of the Lidgerwood Mfg. Company, New York; A. W. Fiero of the Robert W. Hunt Inspection Bureau, Chicago, Ill.; Dr. Chatard of the United States Geological Survey, Dr. R. W. Raymond, New York, and C. Kirchhoff, editor of *The Iron Age.*

Among the large number of members elected were the following: George Best, Pittsburgh, Pa.; W. C. Coffin, Allegheny, Pa.; W. W. J. Croze, Negaunee, Mich.; R. H. Dalgleish, Embreeville, Tenn.; C. F. Frazer, Hastings, Pa.; Andrew Frostberg, Republic, Mich.; Paul Farnum, Pittsburgh, Pa.; Isaac A. Harvey, Bellefonte, Pa.; W. Keyser, Baltimore; H. McCormick, Jr., Harrisburg; Heinrich Macco, Siegen, Germany. E. V. Palmer, Negaunee, Mich.; George A. Pope, Baltimore, Md.; George G. Stone, Chicago, Ill., and J. J. Williams, Youngstown, Ohio.

The only paper of the evening was an address by George F. Kunz of Tiffany & Co., New York, on "The Mining of Gems and Other Minerals in Hungary, Bohemia and Russia," being the observations made in a trip to the countries named. It was chiefly devoted to the deposits of the Ural Mountains. Among the interesting objects shown were specimens of exceedingly fine castings made at the Kasli Iron Works, Asiatic Russia, the medallions and medals showing a beautiful surface. Mr. Kunz alluded also to the famous iron deposits of the Demidoff estate and to the Russia sheet which is there produced.

The session closed with an informal reception of the institute by President Gilman of Johns Hopkins University.

The professional work was begun in earnest in

The Second Session,

which opened with the reading of a paper by H. M. Howe of Boston, on "The Copper Mines of Vermont," followed by an abstract of a contribution by H. B. C. Nitze of Chapel Hill, N. C., on "The Magnetic Iron Ores of Ashe County, N. C." As yet these magnetic deposits are inaccessible, but considerable prespecting done during 1890 has shown that they may be divided into three belts, having a general northeast and southwest trend. The most easterly, the Ballou, or River Belt, crops out along the north fork of New River. The ore is Bessemer, but the deposits do not appear to be very large at any one point. Two to three miles northward is the Red Hill or Poison Branch Belt, opened at numerous points along the outcrop. At some points deposits of magnitude have been shown to exist, the majority, however, being apparently mineralized belts yielding ore comparatively lean. The third belt is the Titaniferous Belt, which is by far the most persistent and shows a large quantity of ore. On the whole, the ores of Ashe County, so far as developed, can be made available only by magnetic concentration, and none of the deposits appear large enough to allow of very cheap mining and the establishment of the large plant which is possible with great bodies of even very lean ore.

During the discussion, E. C. Pechin, Dr. Raymond and John Birkinbine referred particularly to titaniferous deposits, their magnitude and persistency geologically. The president reported that efforts were being made to remove the ilmenite in titaniferous magnetites by magnetic concentration. In one instance fair success has been attained, about 70 per cent. of the titanium being eliminated, while the amount of iron carried off in the tailings was relatively small.

W. H. Hoffman of the Croton mines, Brewsters, N. Y., described the Sturtevant mill, the features of which are widely known. He reported that on well roasted Croton ore he can granulate to 12 mesh 24 gross tons per hour in a 20-inch mill, with an expenditure of 96 horse-power. The cost for renewals compares as follows with the different appliances used at various times at the Croton mines: Common single-jaw Blake soft-steel cover rolls, 1¼ cents; Blake multiple crusher, 3 cents; rolls with chilled cast-iron covers, 4½ cents; Buchanan rolls with soft-steel covers, 2 cents; Sturtevant mill, ⅝ cent per ton of rock.

The secretary then read an abstract of a paper by Edgar C. Moxham of Pulaski, Va., on "The Great Gossan Lead of Virginia," which presented substantially the same information contained in a letter by Mr. Moxham to *The Iron Age*, December 31, 1891, page 1153. From the standpoint of the furnacemen, E. C. Pechin dwelt upon one of the serious drawbacks of the gossan ore, its high moisture, which at times brings the grade down to 33 per cent. He urged that the mining be done only in the summer season, and that the ore be kept stored under cover during winter. He expressed the opinion, also, that the amount of gossan ore available has been considerably overrated, and that the deposits are in reality neither so wide nor so deep as often represented. S. G. Valentine of Lebanon, who has done much to bring the Davis-Colby roaster into successful use, stated that the reported shipment of heap roasted mundic from the Gossan Lead has not yet arrived. The object is to experiment in the Davis-Colby kilns with second roasting. The danger of matting during the heap roasting was pointed out. As soon as a partial fusion takes place in the first calcining, then it is practically impossible to get rid of the sulphur in any subsequent work in a kiln. The difficulty of surmounting this trouble is such that heap roasting, with its irregularities and the inability to control them, is ruled out. W. H. Hoffman reported the results of an experiment made at the Croton magnetic mines with a lot of 100 tons of mundic sent there by A. S. Patterson. It was roasted in the Davis-Colby kilns at Brewsters, modified so as to use Lima oil. Sixty tons was roasted for 85 hours with a consumption of 800 gallons of oil, the sulphur being brought down to 10¼ per cent. The experiment was then stopped, because it was necessary to use the kiln for other work. E. V. D'Invilliers of Philadelphia objected to the following statement by Mr. Moxham: "The higher and more rugged the hills, the greater is the depth of the gossan; the mundic, as a rule, remaining in place with comparative uniformity." He instanced a number of localities where the mundic rises with the crest of the hills. During the discussion the shipment of Ducktown gossan to the Middlesborough furnaces was alluded to as a commentary of the claims for great local iron ore deposits made by Middlesborough boomers.

The afternoon session was taken up with the presentation of a series of papers and the discussion on phosphates. The contributions were: "The Phosphate Deposits of Florida," by Geo. H. Eldridge of Washington, D. C; "Phosphate Chemistry as it Concerns the Mines," by Dr. T. M. Chatard of Washington; "Apatites of Quebec and New York," by John Stewart; "The Association of Apatite and Magnetite, and a Contribution to the Early History of the Phosphate Industry of the United States," by W. P. Blake. "The Green Marls of New Jersey," by Professor Smock; "Notes on the Geological Origin of Phosphate of Lime in the United States and Canada," by Walter B. M. Davidson, and "The Phosphate Deposits of Navassa," by E. V. D'Invilliers.

The Fourth Session.

After the presentation by Spencer Miller of a series of lantern views, illustrating the handling of materials with the aid of aerial cables, the event of the meeting followed, in the paper by James Gayley of the Edgar Thomson furnaces on "The Preservation of the Hearth and Bosh Walls of the Blast Furnace." We present this paper in full elsewhere. During the discussion, in which a number of details were referred to by Mr. Gayley, E. C. Pechin described the bosh plates introduced by him as early as 1876 at the Dunbar Furnace. W. H. Morris of Pottstown, followed with

THE CONTROL OF SILICON IN PIG IRON.

At the Glen Summit meeting the question of controlling the silicon in pig iron was raised; and as this has been deemed by most furnacemen for years past a matter of special difficulty, an account of our experience in the matter may be of interest.

When running on mill iron, some years ago, we aimed to keep silicon between 0.75 and 1 per cent. and were fairly suc-

cessful, but when we had to make iron suitable for our basic Bessemer process we realized that much narrower limits and more uniform work were required. We endeavored as far as possible to obtain ores low in silicon, and by closely watching the conditions of our furnace we have succeeded in securing an iron which runs below 0.45 silicon and 0.05 sulphur. Our best week's work averaged 0.265 silicon and 0.05 sulphur; only 7 per cent. of the metal exceeding 0.08 sulphur. This was done with iron stoves. After remodeling our furnace and adding fire-brick stoves we have run for weeks at a time on such standards as were fixed upon, with a variation not exceeding 2 to 3 hundredths, though we have varied our requirements considerably from time to time. We have made a great deal of iron below 0.10 silicon, and even down to a trace, in which sulphur did not exceed 0.017; and we have also run our phosphorus as high as 4.5 per cent. Such metal is very fluid in the runner and very brittle when broken in the bed. The successful manufacture of a special iron of this grade requires very regular furnace work. Both ore and limestone should be as nearly uniform as possible in quality as well as size, and the fuel should not be high in sulphur. We have tried varying proportions of coke and coal, and the size of our hearth seems well adapted to about half and half. If the furnace works more slowly or has a stoppage, it means higher silicon in the pig, and in case of a slip the same thing is true, with risk also of increased sulphur. If the furnace is run too cold the sulphur will all be in the iron. The sulphur in our pig runs from a trace to not over 0.03 per cent. and our phosphorus averages about 3 per cent., making white iron, somewhat resembling spiegel in its fracture. In a general way the control of the silicon in the iron means good management of the furnace, especially where close results are required on sulphur as well, and this can only be obtained by constant care and watchfulness in keeping all the conditions uniform. Of course the quality of the cinder and the heat required to melt it are important considerations.

Our practice is to take and cast in chills samples of iron from the runner at the first and the latter part of the run, and the same from each flush of cinder. All our materials are analyzed as well as these samples of iron, and daily analyses are made of cinder, so that we can watch the furnace, not only in its running, but in the changes indicated by the iron and the cinder.

If buyers wish iron of special chemical composition, they should name it in their specifications, and must be willing to give up the old method of grading. For instance, all furnacemen know that an iron graded as No. 2 or No. 3 foundry may sometimes run as soft on remelting as an ordinary No. 1, and the chemical composition of such an iron would correspond to that of a No. 1, though under the present method of grading it would not be accepted as such by a foundryman.

I annex a few anylyses of casts showing remarkably low results in both silicon and sulphur, and also the average weekly run of our iron, which all speak well for the fidelity of our furnace manager. The figures for 1887 were got with iron stoves, and in running under a specification requiring silicon not over 0.75 and sulphur not over 0.08. In 1891 we had fire-brick stoves and aimed at silicon not over 0.50 and sulphur not over 0.05.

Selected Casts Showing Remarkably Low Silicon and Sulphur.

Silicon.	Sulphur.		Silicon.	Sulphur.
Trace.	0.017		Trace.	0.025
Trace.	0.036		Trace.	0.039
Trace.	0.041		0.023	0.028
0.045	0.033		0.047	0.030
0.047	0.047		0.047	0.033
0.093	0.019		0.093	0.022
0.093	0.021		0.093	0.030
0.093	0.028		.....	.....

Weekly Averages.

Week ending.	Average.		Highest.		Per ct. of product above limit for.	
	Si.	S.	Si.	S.	Si.	S.
1887.						
April 16....	0.455	0.052	0.887	0.096	6.75	6.25
April 30....	0.452	0.065	0.677	0.096	.....	7.30
May 28.....	0.265	0.050	0.653	0.091	.....	7.40
June 4.....	0.281	0.053	0.490	0.088	.....	6.25
1891.						
June 6.....	0.245	0.035	0.747	0.170	6.50	16.00
July 4..	0.312	0.024	0.700	0.093	8.25	11.25
August 8...	0.350	0.024	0.980	0.082	13.15	10.60
August 9..	0.319	0.020	0.513	0.050	2.50	.....
Sept. 5.....	0.285	0.021	0.560	0.083	11.50	7.00
October 10.	0.298	0.029	0.746	0.148	12.60	13.00

An animated discussion followed, in which a large number of blast furnace managers present participated. Dr. Raymond read a communication by B. F. Fackenthal, Jr., from which we take the following:

The analysis of the ore mixture at Durham Furnace, and which was made up of seven eighths high-phosphorus magnetic ore and one-eighth puddling-furnace cinder, was as follows:

	High phos. magnetic.	Puddling cinder.	Limestone
Metallic iron	54.93	55.76	0.54
Aluminum	2.71	.....	2.00
Lime	6.99	.....	27.62
Magnesia	1.23	.....	18.75
Silica	7.22	17.70	8.84
Phosphorus	1.96	2.31	0.027
Sulphur	...	...	0.020
Tartaric acid	1.18	.....	.....

Previous to putting on this mixture the furnace was making Bessemer pig, the grade for several days previous being all No. 1. The slag was gray and carried about 37 per cent. of silica. When the basic mixture came down the color and fluidity of the slag remained the same, the additional proportion of lime being the only change noticed, even when making white pig iron, the grade aimed at being gray mottled.

A complete analysis of the slag, being an average for four days, is shown as follows:

Silica	32.73
Protoxide of iron	0.98
Alumina	9.51
Oxide of manganese	0.77
Lime	32.84
Magnesia	17.08
Sulphide of calcium	2.39
Phosphoric acid	0.22
Titanic acid	2.35

Other analyses of slag showed 32.40 per cent., 33.50 per cent. and 32.94 per cent. of silica. Some of the white pig iron carried as low as 0.063 per cent. of silicon; other tests showed 0.070 per cent. and 0.084 per cent. Seven different lots of gray forge and mottled showed, according to the Pottstown Iron Company's analysis, but a trace of sulphur. Complete analyses of certain lots of pig iron are given in the following table, although they do not represent an average of all the iron made. The No. 2 was taken from a cast before the mixtnre was fairly at work:

	No. 2	Gray forge.	Mottled.	White.
Phosphorus	2.900	3.920	3.980	3.620
Silicon	0.605	0.329	0.312	0.096
Sulphur	0.024	0.010	0.025	0.055
Manganese	0.225	0.333	0.314	0.131
Combined carbon	1.045	1.258	0.816	2.271
Graphitic carbon	2.407	1.936	1.987	0.079
Titanium	0.217	0.259	0.170	0.023
Iron (by dif.)	92.577	91.755	92.396	93.725
Totals	100.000	100.000	100.000	100.000

It is interesting to note the decrease of titanium (after the mixture was fairly down) as the grade is lowered. During the time of our experiment the furnace worked uniformly and the output continued to be about the same as it had previously been running on our Bessemer mixture. The iron in running was exceedingly fluid, and I was not able to distinguish the different grades while running. It cooled rapidly, and on breaking from the sows was very dry. The faces of the pigs appeared full and smooth, being practically free from honeycombs, but owing to the high phosphorus the shrinkage was great. This was shown by the large, irregular wavy depressions on the face of the pigs, often 2 inches to 3 inches long, ¼ inch to ⅜ inch deep, the sides of the depression being square and not rounded, the sides and bottom of the pigs showed a wrinkled surface and some of them were checked and the iron was quite weak, often breaking by ordinary handling.

A great many theories have been advanced as to the control of silicon in pig iron.

I claim that the controlling influence is due to the character and composition of the ores, more than to the composition of the slag, temperature of the hearth, ash of the fuel, or to the management of the furnace. An ore mixture suitable for making basic pig iron (leaving out the question of phosphorus) will not produce iron high enough in silicon for foundry purposes. At Durham we are using a mixture made up mostly of magnetic ores and producing gray forge pig iron containing less than 1 per cent. of silicon, and we cannot produce iron from this mixture high enough in silicon for foundry purposes, but when substituting, say, one-half of brown hematite ores or any other ores in which the silicon is combined with the oxide of iron (the composition of the slag, fuel and other conditions remaining the same) the silicon is at once increased, our last experiment with a foundry mixture produced iron carrying 3 per cent. of silicon.

Several years ago, when making Bessemer pig both at Durham and Pequest furnaces, we experienced some difficulty in getting our silicon high enough. It could, of course, be controlled to a certain extent by an increased fuel consumption and by the composition of the slag, but the good and economical working of a furnace should not be disturbed, and besides there are other conditions and other chemical properties to be considered besides the silicon. At the Pequest Furnace, with a mixture made up largely of foreign ores, we produced Bessemer pig carrying about 1½ per cent. of silicon; a substitution in the mixture of 10 per cent. of brown hematite ore (from Dutchess County, N. Y., carrying 0.04 per cent. phosphorus), immediately gave us iron with 2½ per cent. silicon, the slag, fuel and other conditions remaining the same. If the silicon can be so easily controlled by the operation of the furnace, we might ask why our friends in the Birmingham (Ala.) district make iron so high in silicon. I am told that some iron arriving in Philadelphia market some time since contained over 7 per cent. of silicon. Mr. Jamme says that rapid driving is a *sine qua non* for reducing high silicon in his pig. Pig iron low in silicon is not suitable for foundry iron, but with the Clinton ores from Red Mountain the trouble seems to be to get it low enough.

In Mr. Robertson's paper (Trans. XVII, page 94), read at the Birmingham meeting, he gives the silicon in Birmingham iron as varying between 2.44 per cent. in No. 2 mill to 7.09 per cent. in No. 2 C; his gray forge (being one-half of each No. 1 mill and No. 2 mill) contains 2.65 per cent. of silicon. He mentions 13 different grades, including gray forge and silvery mill. I take it that these high silicons are beyond the control of the furnace manager and due entirely to the ore mixture.

Mr. Cook of the Warwick Furnace, during 1888 (Trans. XVII, page 127), was passing stock through his furnace in from 14 to 15 hours; his silicon averaged from 0.588 per cent. to 0.945 per cent. This iron, already too low in silicon for ordinary foundry purposes, could not be improved by faster running, which Mr. Jamme

says is so essential. Mr. Cook runs a very basic slag, but I take it that his low silicon is due, within certain limits, to his ore mixture.

F. E. Bachman of Salem Furnace stated that the use of heating furnace cinder developed no tendency to make high-silicon iron, while W. E. C. Coxe reported that in making high-silicon iron in the Hocking Valley, carrying 10 to 12 per cent. of silicon, there was no trouble when using cinder and native ore. E. C. Pechin reported that in Virginia high-silicon and low-silicon irons are made from the same stock, while G. F. Knapp of the Pennsylvania Steel Company stated that without changing the stock iron is made to specification at the works in question at any point within the range of 2 to 0.5 silicon at 24 hours notice. Dealing with the manufacture of low-silicon and low-sulphur irons, Mr. Knapp presented the following record: In one month the highest silicon was 1.14 per cent. and the lowest 0.03 per cent., the average 0.53 per cent., the average sulphur being 0.04, with 0.09 as the maximum and a trace as the minimum. In one week the silicon averaged 0.2 and the sulphur 0.04, while in three weeks of one month the average was 0.43 silicon and 0.03 sulphur, 80 per cent. of the make being below 0.5 silicon and 90 per cent. of the product below 0.05 sulphur.

The meeting closed with an outline, by John Birkinbine, of the material collected by him for an address on "The Influence of Market upon the Development of the Pig Iron Industry." Some of the data to complete the address have not yet come to hand, so that it will be presented in full at a later date. John F. Wilcox of Pittsburgh, commenting on the address, stated that there will be an addition to the capacity of the Pittsburgh district of 160,000 tons annually by three new furnaces. Two of these, we understand, are the furnaces to be built at the Duquesne works of Carnegie Brothers & Co.

Thursday was devoted to a trip to Annapolis, under the guidance of James G. Dagron, bridge engineer of the Baltimore and Ohio Railroad, who furnished a special train. The State House and the Naval Academy were visited, and a reception was tendered to the institute by the Governor of Maryland. In the evening the usual banquet was held at the Hotel Rennert.

Friday was excursion day, the party starting by boat on a tour of the Patapsco River, the first point visited being the Cheasapeake Pottery, followed by an inspection of a part of the plant of the Baltimore Copper Company, one of the largest copper refining plants in the country. Then the party proceeded to the famous works at Sparrow's Point of

THE MARYLAND STEEL COMPANY,

whose famous plant was inspected under the guidance of H. W. Wood, the president.

The manufacturing plant at the present time consists of four blast furnaces, of which three have been in operation, and the fourth is ready for work at any time, Furnace C being the only one in blast at present; a Bessemer plant and rail mill; the marine department or ship yard, machine shop, pattern shop and foundry partly completed and in operation. All the buildings and other improvements on the property have been placed since the Pennsylvania Steel Company commenced operations in 1887. In addition to the railroad facilities, a ship channel 27 feet deep and 150 feet wide connects the company's wharves with the main ship channel 1 mile distant. Of the piers, No. 1, 40 feet wide and 600 feet long, was built in 1887; No. 2, finished in 1890, is 900 feet long and 100 feet wide. These piers will accommodate six steamers, are designed chiefly for the handling of cargoes of iron ore and for shipping the products of the works; they will be equipped with the anost approved appliances for this work.

The four furnaces now built are each 85 feet high and 22 feet bosh. The blast is supplied by double vertical condensing engines, built from designs of the company. The blowing cylinders of these engines are 84 inches in diameter by 60-inch stroke. Steam is supplied by Babcock & Wilcox boilers, 4000 horse-power being allowed each pair of furnaces. The blast is heated in Whitwell stoves 70 feet high and 22 feet in diameter, of which there are four for each furnace. The blowing engines have been described and illustrated in *The Iron Age*. It may be noted that when the Bessemer blowing engine was off for repairs the blast for the vessels was furnished by one of the furnace engines. A very interesting feature of the plant is the arrangement for conveying the stock barrows from the bins to the hoist. Along the whole line of the stock house run on a depressed track two electric cars, on whose platform the stock barrows are run. They convey them to the stock hoists. Thus the labor of wheeling is reduced to the short distance between the stock bin and the electric car, and from the latter to the stock house platform, the electric cars, of course, also handling the empties.

The Bessemer plant is equipped to work with either direct metal from the blast furnaces or remelted metal from the cupolas. The plant is designed for four 18 ton converters, two being now in operation. When running on direct metal, the iron is put through a mixer, which discharges on the general level, whence the ladle is lifted by a hydraulic elevator to the Bessemer platform. The most interesting feature of the Bessemer department is, however, the casting operation, which was witnessed by the party. The pit has been abandoned, and the whole of the casting area is commanded by an overhead ladle crane. The molds are placed in a vertical position on cars so designed that their mechanism is not subject to injury from splashing metal. The ladle hangs over the train of molds in a stationary position, the cars carrying them being moved mechanically as mold after mold is filled. When two ingots have been cast the car carrying them is taken off by a locomotive. In case of need, of course, the ladle can be moved by the overhead crane from mold to mold. The whole operation is exceedingly smooth, and the effect of the abandonment of the pit upon the cleanliness and comfort of the Bessemer plant is striking. There can be but little question that the system in which the Maryland Steel Company have taken the initiative will become the standard arrangement for large Bessemer plants. Back of the converter house is a very commodious and complete building for working and drying bottoms, &c.

From the Bessemer department the ingots are conveyed to the blooming mill. They are stripped by a double vertical stripper and go to two blocks of pit heating furnaces.

The blooming mill is of the "two-high" reversing type, with rolls 36 inches in diameter, driven by a pair of 42 x 60 reversing engines. Beyond the rolls is a hydraulic shear for cutting off the ends of the blooms. The blooms pass direct from the blooming mill table through the shear to the rail train, where they are rolled into rails without reheating.

The rail train is "three-high," with rolls 26 inches in diameter, driven by two 48 x 66 Porter-Allen engines. When work is slack the train can be driven by one engine alone, one of the principal considerations kept in view in designing the plant being to allow of slow running economically in dull times. This train is fitted with tables for handling the bars from the different passes mechanically, and is arranged for turning out finished rails six lengths (180 feet) each. The six-length rails are rolled on the lighter sections, the number of lengths being reduced as the weight of the section increases. The object is to keep the weight of the ingots uniform. Beyond the rail train are the sawing, straightening and drilling appliances.

One particular feature of the hot beds is that the rails in cooling do not touch one another, so that little subsequent straightening work is necessary.

On that portion of the property lying east of the Bessemer and rail department an extensive plant of open-hearth furnaces is projected, the product of which will be distributed among the blooming mills, plate and structural shape mills, to be erected in connection with them.

The marine department, although not complete in its various details, is in active operation. On the fitting-out pier, alongside which vessels will be taken as soon as launched, to receive their machinery and outfit, is being erected a machine shop of magnificent dimensions, and a hoisting shears of 100 tons capacity, the legs of which were being completed in the marine department. The other buildings comprise the tool sheds, smith and machine shop, joiner and plane shop, and dry house. There are now completed four slips for vessels 250 to 300 feet long, and others for larger vessels are to be added as required. One steel seagoing tugboat has been recently completed, another is nearly finished. A side-wheel steamer 210 feet long and a propeller steamboat 305 feet long, for the service of the Baltimore Steam Packet Company between Baltimore and Norfolk, are now under way. In order to reduce the vibration to a minimum the triple-expansion engines will have two low-pressure cylinders.

The machine shops, one section of which is now erected and partly in operation, are intended to produce the apparatus required for the extension of the manufacturing plant, and the engines and other machinery required by the shipbuilding department. The present shop is one of three bays, of which the other two will be used as erecting and light tool shops.

In the foundry heavy castings for the works and for the shipyards are being made and handled by hydraulic cranes, to be aided by a 50-ton electric traveling crane which is nearly completed.

On the return from the works, during transit to the city, a brief business meeting was held. For Saturday a series of excursions to local points of interest were on the programme, while a small party went to the Indian Head proving grounds to witness a test of some of the modern guns.

The proportion of the exports of all articles of food during the calendar year 1891, as given by the Bureau of Statistics, is as follows:

Article.	Total exports.	To Great Britain.
Cattle	$28,363,894	$27,132,380
Corn	19,876,526	10,651,183
Wheat	133,178,442	54,422,586
Wheat flour	64,783,861	39,761,357
Beef, canned	7,561,220	5,489,781
Beef, fresh	16,634,448	16,590,965
Beef, salted	4,291,023	2,187,559
Bacon	36,334,080	29,808,590
Hams	8,025,544	6,048,110
Pork	4,475,409	1,174,054
Lard	31,073,394	8,951,151
Cheese	7,198,719	6,006,793
Total	$361,796,560	$208,224,509

This makes the amount of the above articles exported to Great Britain fully one-half, or 50 per cent. of the whole, against two-fifths, or 40 per cent., for the fiscal year ending June 30, 1891.

Blast Furnace Slags.—I.

Their Calculation by Graphic Methods.

BY A. J. ROSSI, NEW YORK.

The operations described in previous articles (*The Iron Age*, volume LVII, pages 426, 528, 578, 723, 821) take a longer time to explain than to execute. We will resume them in a practical manner, taking another example and illustrating them by diagrams.

Suppose that, having a mixture of ores of which the average composition is (first ore):

Silica	15	
Alumina	3.50	11.50. Sum of bases.
Lime	3	
Magnesia	4	
Alkalies	1	

and disposing of a coal containing 10 per cent. of ashes, of which the analysis in per cent. of the coal is as follows:

Silica	6	
Alumina	2.75	4. Sum of bases.
Lime	0.60	
Magnesia	0.30	
Alkalies	0.35	

we have decided to use ¾ ton of such coal per ton of ore. Were such an amount found deficient or in excess, it can, of course, be altered by the ironmaster. In the amount of coal used, ¾ ton, there is then only as hundredths of a ton of each constituent:

Silica, $6 \times \frac{3}{4} = 4.50$ % of a ton, or $\frac{4.50}{100}$ ton.

All bases, $4 \times \frac{3}{4} = 3.00$ %, or $\frac{3.00}{100}$ tons.

Wishing to use a limestone containing:

Silica	8	
Lime	48.50	51. Sum of bases.
Magnesia	2.50	

We desire to calculate how much of such a stone ought to be used with 1 ton of ore and ¾ ton of fuel so as to obtain a slag containing 35 per cent. of silica, the quantity of silica expected in the complete analysis and judged proper to insure for the slag a certain character of fusibility and composition corresponding to the production of a certain grade of foundry iron aimed at. Taking a sheet of profile paper ruled to the millimeter, for instance, (or to the decimal of an inch), see diagram B, assume 2 mm. for each 1 per cent. of the constituents. The paper being ruled to the millimeter, each division will represent ½ of 1 per cent., and, as the half space between two lines of the paper can readily be estimated, we could, in fact, were it necessary, read exactly ¼ of 1 per cent. Read from A, the zero point of diagram, and above it to 15 + 4.50 = 19.50, the sum of silica of ore and fuel. Read below A (zero), 11.50 + 3.00 = 14.50, the sum of bases of ores and fuel. Draw a line connecting the point 19.50 on B C with the point 14.50 below A. Read on A B to the right of A the percentage of silica assumed in the slag (35 in this case), and following on the diagram this vertical line erected at 35 until it intersects the horizontal line 19.50–19.50. At the point of intersection draw a parallel to the 19.50–14 50 of diagram. Thus the point K on the diagram is obtained. Now carry or read on A B to the right of A from 0 of diagram the sum of bases of stone (in this case 51.00), and on A B to the left of 0, zero of diagram, the silica of the stone (8 in this case). Following the vertical 51–51 on diagram join 51 (at top on D C) to 8 to the left of A, and reading downward 35 on the vertical 51–51 draw by the point thus obtained (35) a parallel to (51–8). Thus the point Q of diagram is obtained. By B-100 on diagram draw a parallel (B R) to the line K Q. It intersects the vertical A B on the diagram at a point R, and A R is the amount of the limestone required. We read easily on the diagram A R = 60, or $\frac{60}{100}$ ton (exactly what a rigorous calculation would give). Hence, with the above ores, stone and fuel, the charges of the furnace to obtain a slag containing 35 per cent. silica would be:

Ore	1 ton
Fuel	¾ ton
Stone	0.60 ton

and were the ores 50 per cent. rich in iron, neglecting as usual in ordinary cases the small percentage of iron oxide which goes in the slag, and reckoning the pig iron at 100 of iron, the charges per ton of pig (counted as 100 of iron), would be:

Ore	2 tons
Fuel	1.50 tons
Stone	1.20 tons

A consideration of the formula which has led to the preceding construction suggests very interesting deductions.

We have for the quantity of limestone required, y.

$$y = \frac{(a + a') - (a + a' + b + b')\,m}{(a'' + b'')\,m - a''}$$

m is in decimals the percentage of silica adopted. The numerator or dividend consists of $a + a' + b + b'$, the sum of all the constituents of ores and fuel, and of $a + a'$, the sum of the silica of both these materials. It does not contain any of the constituents of the limestone, consequently is independent of the composition of the latter. The denominator or divisor, on the contrary, contains only these very elements, $a'' + b''$ being the sum of the silica and bases of the stone and a'' the silica of the stone; this denominator or divisor therefore is independent of the ores and fuel used and remains constant for the same stone.

In many furnaces the limestone is obtained from a certain quarry and can be practically considered to be constant in composition. The same could be said even of coal, which enters only by its ashes in the slag. In any case the differences in the analyses of these materials are not such as to practically affect the amount of stone calculated. The ores, particularly when mixtures of ores are used, represent, it may be said, the real variable element in a furnace; they often vary from day to day. It may prove interesting then to study the variations in the quantities of limestone required for the same percentage in silica in the slag, which correspond with different compositions of ores, the stone and fuel being taken as nearly constant in composition, this percentage of silica in the slag corresponding with a normal run of the furnace on certain grades of iron.

For illustration, assume a second ore of the following composition: Silica 10, and all bases 7, instead of silica 15.00 and all bases 11.50, as before in the first ore, the fuel and stone being the same. Referring to the diagram, we have the sum of the silica of ores and fuel = 10 + 4.50 = 14.50. We carry from A on the diagram above A to 14.50. Below A we read the sum of all bases of ores and fuel = 7 + 3 = 10. Following the horizontal line 14.50–14.50 to B C, we join 14.50 on *B C* (second ore) to 10 (second ore), and at the point where the vertical passing through 35 (silica adopted) intersects the line (14.50) (14.50) for the second ore we draw a parallel to the line 14.50 (second ore)–10 (second ore). Thus we obtain K′ joining Q K′ (Q remaining the same) and through B drawing a parallel to Q K′ on diagram we find at J the quantity of limestone required with this second ore, A T, = 47, or $\frac{47}{100}$ ton very nearly; the exact calculation would have given 0.468. All the construction for this second ore has been made in dotted lines to avoid confusion.

It is possible to solve the same problem in a different manner. Let us represent this denominator, which is constant, as we have seen, for a given stone, by D, and the dividend or numerator by N; the quantity of limestone, y, necessary for a certain ore and fuel and amount of silica, m, is represented then by: $y = \frac{N}{D}$ and the quantity y' of the same stone required by a change in the ores will be then: $\frac{N'}{D}$. Hence these two quantities, y and y', of the same stone, corresponding to different ores (and fuel, for that matter), are proportional to N and N'. $y : y' :: N : N'$, or, $\frac{y}{y'} = \frac{N}{N'}$; this furnishes an easy, graphical method to determine the new amount of stone required. Returning to the first diagram, let us carry on A B — (zero — 100) of the diagram, A R′ = y = 60 (stone for first ore), the quantity of stone found graphically for the ore and fuel, which have furnished us the numerator N = AK. Follow the horizontal line passing through the point K, corresponding to the first numerator N, to its intersection at S with the vertical line passing by 60 (stone first ore), R′ S thus being equal to A K. Now join A G. This line once established for the first ore used will allow us to find readily the amount of the same stone corresponding to changes in the ore.

Suppose that a new ore or mixture of ores has furnished us a new numerator, A K′, found in the proper manner for this ore. Follow with the eye on diagram, or draw the horizontal passing through K′. It intersects A G on diagram at G′ (second ore), which reads immediately on A B, by following the vertical S′ R′, A R′ = 47, or $\frac{47}{100}$ (second ore). This is the new amount of stone required with the new mixture of ores (second ore) which has furnished us the numerator or dividend A K′ = N′. The same sheet of paper can serve for several diagrams or a new sheet be taken for each, and sheets already numbered from 0 to 100 as explained for such purposes. The constructions made, these sheets can serve as records of the work of the furnace by putting on them the actual analysis of the slags obtained and also the grades of iron. Graphically the manager can judge at a glance how close his furnace has worked to calculated results. The formula which has given us the limestone required,

$y = \frac{(a + a') - (a + a' + b + b')\,m}{a'' + b'')\,m - a''}$ can be written for simplification $y = \frac{A - Bm}{Cm - D}$

A being taken = to sum of ores and fuel.
B being taken = to sum of all the constituents of ore and fuel.
C being taken = to sum of all the constituents of stone.
D being taken = to silica in stone.
m being taken = in decimals to the percentage of silica expected in slag.

The amount of lime required to be added to 1 ton ore and ¾ ton of fuel (y), must, of necessity, be a positive quantity. This condition will be fulfilled when we have at the same time $m \left\langle \frac{A}{B} \right\rangle \frac{D}{C}$

In the example taken (first ore), $A = 15 + 4.50 = 19.50$; $B = 19\ 50 + 11.50 + 3.00 = 34.00$; $C = 51 + 8 = 59$; $D = 8$. Hence, m, the percentage of silica assumed in slag, must be smaller—that is, cannot be greater, than $\frac{A}{B} = \frac{19.50}{34} = 0.57 = 57$ per cent., nor smaller than $\frac{D}{C} = \frac{8}{59} = 0.135 = 13.50$ per cent. That

is to say, with the ore, fuel and stone of the composition given (first ore) it would be impossible to obtain a slag containing as much or more then 57 per cent. of silica or less than 13.50 per cent., and were such quantities deemed essential in the slag to impart to it certain characters of fusibility, or for some other reasons, with such materials at our disposition we could not obtain it. Of course the margin is pretty wide between 13.50 and 57.00, but ores, fuel and stone may present such composition as would narrow these limits considerably.

For instance and for the sake of illustration (though the analyses given below are actual analyses), rich hematites or magnetites of New Jersey and Missouri, certain coals from Tennessee, and limestones from New Jersey presented the following composition:

Ores.

Silica	1.88	
Alumina	0.93	1.86
Lime	0.49	
Magnesia	0.29	
Alkalies	0.15	

Coal.

Silica	1.70	
Alumina	1.10	1.90
Lime	0.20	
Magnesia	0.10	
Alkalies	0.50	

Stone.

Silica	13.50	
Lime	27.00	44.96
Magnesia	17.16	
Alumina	0.80	

We would have

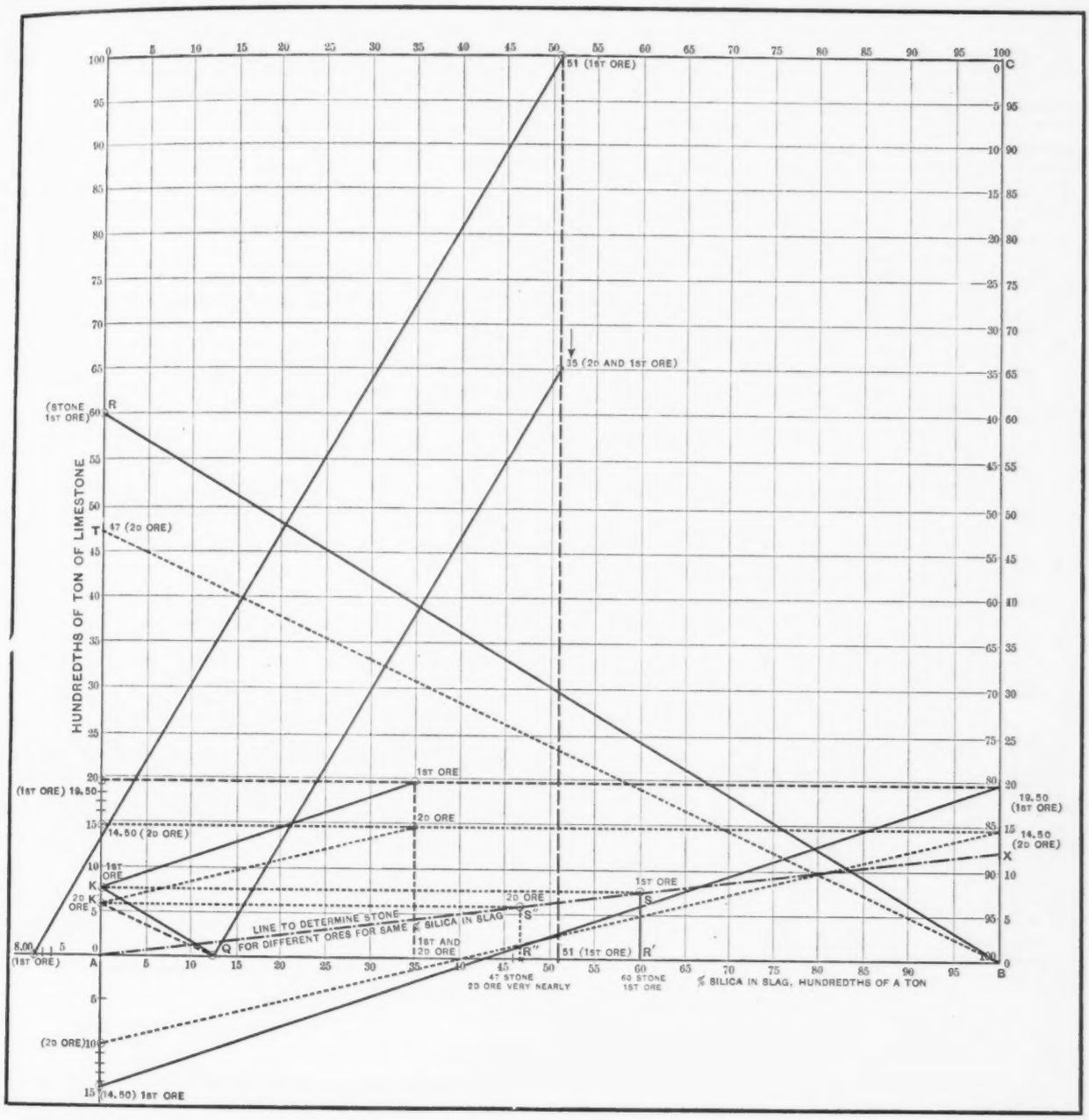
A, sum of silica of ore and fuel = 1.88 + 1.70 = 3.58.

B, sum of all constituents of ore and fuel = 3.58 + 1.86 + 1.90 = 7.34.

C, sum of all constituents of stone = 13.50 + 44.96 = 58.46.

D, silica of stone, = 13.50, and it would be impossible to obtain a slag containing more than $\frac{A}{B} = \frac{3.58}{7.34} = 0.487$, or 48.70 per cent. silica, or less than $\frac{D}{C} = \frac{13.50}{58.46} = 0.2308$, or 23.08 per cent. silica. We see from the above how easily we can graphically determine the amount of stone required to obtain with certain ores, stone and fuel a slag containing a percentage of silica assumed *à priori*, and how having determined it for a given ore we can, supposing the composition of the stone to remain the same, study and determine graphically the changes in the quantities of this stone resulting from variations of composition in the ores.

(To be continued.)



Self-Governing Pelton Motors.

The latest motors made by the Pelton Water Wheel Company of San Francisco, Cal., are provided with a throttling valve and a centrifugal governor, to regulate the speed under varying loads. The centrifugal governor is arranged to move two bevel friction pinions to the right or left, as the speed determines, and then drive the wheel gearing either way, and moving a toothed sector which is so arranged as to operate a valve governing the pressure or amount of water according to the speed of the wheel and the resistance of the work.

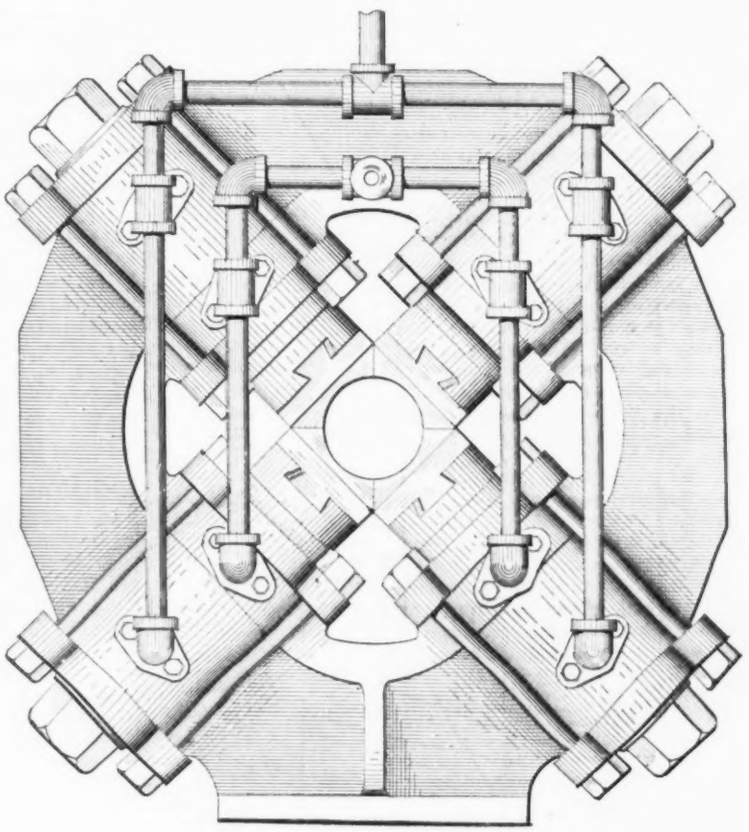
The American Federation of Labor may feel it necessary to boycott the World's Fair exhibition or Chicago, on account of alleged discrimination on the part of the management against labor unions. A president of one of the broth erhoods affirms that "a representative of any labor union cannot get a pass to any of the buildings," that if by any means he gets on he is at once put off by the police, of whom there are 200 on the grounds, and a man cannot get a job under the chief of construction if he is a member of any trades union, neither can he be employed as gatekeeper or watchman, which is rather s evere.

The Pittsburgh Wire Company.

The Pittsburgh Wire Company were organized in Pittsburgh some months since for the purpose of engaging in the manufacture of wire rods and wire. Shortly after the organization was effected contracts for the erection of the plant were let, and after numerous unavoidable delays the rod mill proper has been completed, while work on the wire mill is being pushed as rapidly as possible, and this department is expected to be in operation within the next 60 days, and will manufacture copper and steel wire of all descriptions. The plant of the Pittsburgh Wire Company is located at Braddock, Pa., 10 miles from Pittsburgh on the lines of the Baltimore and Ohio Railroad and the Pittsburgh, McKeesport and Youghiogheny Railroad. The main building, in which is contained the rod mill and wire mill, is 125 feet wide by 400 feet in length. The rod mill is of the continuous mill design, and contains a 16 inch and 12-inch billet train and a 9-inch finishing train. These trains and housings were furnished by the A. Garrison Foundry Company of Pittsburgh, and were erected under the supervision of Lieut. T. W. Fitch. The 16-inch and 12-inch trains are driven by a 36 x 48 engine, built by Mackintosh, Hemphill & Co., Limited, which is expected to develop 1600 horse-power, while the 9-inch train is driven by a 20 x 24 automatic engine of 500 horse-power, built by the same firm. The fuel used is producer gas, furnished by four Taylor gas producers, operated in connection with two Morgan inclined heating furnaces for heating billets. The boiler house is built immediately adjacent to the rod mill, and is equipped with 2000 horse-power Babcock & Wilcox boilers, furnished by the Pittsburgh agency of that firm. These are fired by Murphy mechanical stokers, erected by the Murphy Iron Works of Detroit, Mich. All coal used is hoisted from the Monongahela River by a boom and is transported in cars on a trestle to the boiler house and dumped into the stokers. An extension of this trestle through a dome in the main building has been erected, in which coal will be transported to the gas producers. As stated above, the rod mill has been completed, the first rods having been turned out last week. The rod mill went on double turn on Monday, the 22d inst., the firm having already booked sufficient orders to keep their plant running double turn for several months to come. It is expected that when the plant is in good running order it will turn out 150 tons of wire rods every 24 hours. The contract for the erection of the wire machinery has been awarded to the Morgan Construction Company of Worcester, Mass., and already considerable progress has been made. The wire mill will be equipped with 96 wire-drawing blocks, driven by two 20 x 24 automatic engines, built by Mackintosh, Hemphill & Co., Limited. All the buildings are of corrugated iron, and were built by the Shiffler Bridge Company of Pittsburgh. The plant has excellent shipping facilities, having direct connection with the Pennsylvania Railroad, Baltimore and Ohio Railroad and Pittsburgh, McKeesport and Youghiogheny Railroad. The Bindley Hardware Company of Pittsburgh are the general agents for the Pittsburgh Wire Company, and will handle all the product of the concern, purchase all the raw material and supplies for it, and in addition will have entire charge of the accounting and financial departments. Lieut. T. W. Fitch, who is general superintendent, has an experience of many years in the manufacture of wire rods and wire, having been engaged in that line of business in St. Louis for many years before coming to Pittsburgh. The above is the second wire mill built at Pittsburgh under his supervision, and it is said to contain all the latest improvements in machinery, mechanical appliances and labor-saving devices used in wire rod mills at the present time. Lieut. Fitch is president and superintendent of the Pittsburgh Wire Company.

Banding Machine for Projectiles.

A representative of *The Iron Age* saw recently at the works of the American Projectile Company a very simple and effective machine for upsetting or compressing the copper riveting bands on projectiles, the invention of Lieut. W. M. Wood. Upon a heavy frame are carried four cylinders, placed horizontally and at equal distances apart, as shown in the drawing. Each cylinder carries a plunger, the axial lines of which meet at a common center. On the inner ends of the plunger rods are carried segmental dies. It is evident that by changing these dies the machine can be made to fit any diameter of projectile, or, in other words, the diameter of the circle formed by the four dies when in their closest position can be varied to suit circumstances. Provision is made for actuating the plungers by hydraulic pressure. The rotating band is placed loosely upon the projectile, over the groove, and is then placed centrally in the dies. The plungers, all moving toward a center, compress or upset this ring, which is firmly imbedded in the groove made in the projectile to receive it.



PLAN VIEW BANDING MACHINE FOR PROJECTILES.

Some opinion can be formed of the extent of irrigation works in Egypt from the statement of a recent official expert. The irrigated area cultivated is 565,744 acres, or 8840 square miles, extending along the River Nile for a distance of 525 miles. The population of the irrigated country is set down at 5,879,431, and the revenue derived by the Government from water tax and rented lands was in 1890, $25,422,735. English capitalists are chiefly concerned, and the profits of cotton culture realized from irrigation will inure chiefly to their benefit.

The latest addition to the British Navy is the Grafton, one of the nine high-speed cruisers to be built under the Naval-Defense act. She is expected to have a speed of 22 knots and a capacity of steaming for 10,000 miles at a 10-knot rate, when furnished with her 12,000 horse-power triple-expansion engines. Her length is 360, her beam 60 and her depth 23 feet 6 inches. Vertical armor is discarded in these cruisers, but the machinery, boilers, magazines, torpedo heads, &c., are covered by a protective deck running from stem to stern. This deck has a maximum thickness of 5 inches and a minimum thickness of 2 inches, and all round the deck opening coffer dams are provided. The engines, rising above this protective deck, are protected by an inclined armor-plate shield 5 inches thick and backed with teak; the conning tower is of Cammell's steel-faced armor, 12 inches thick; the magazines are of 3 inch armor, and a double bottom is constructed the whole length of the engine. Vickers steel casemates of novel form protect the "'tween"-deck guns. The armament will consist of two 9.2-inch and ten 6-inch quick-firing guns, sixteen quick-firing guns and four 14-inch Whitehead torpedo tubes.

Contracts have been signed and arranged, at Duluth, for the building of the big ore docks of the Duluth and Northern Railroad. The docks will be the largest in the world, being 54 feet above water, or 24 feet higher than the docks of the Duluth and Iron Range, which are now the highest known. The docks will cost $200,000. It is expected that next year the docks will have to be doubled.

Solid Die Rivet Machine.

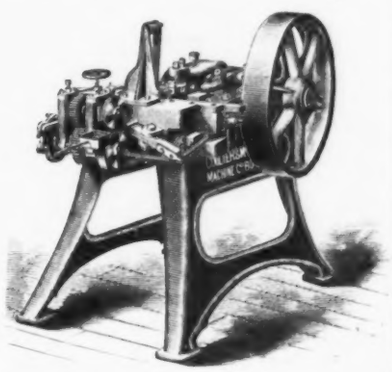
The Coulter & McKenzie Machine Company of Bridgeport, Conn., are introducing a new rivet machine, which is illustrated in the cut here presented. While the principle is much the same as in other similar machines of late design, still there are some important changes that are particularly interesting to rivet manufacturers —for instance, in the manner of cutting and carrying the blank. The cutter bar is driven by an oscillating gear operated by a rack bar, which is driven by a cam (instead of the eccentric and wedge so generally used). This same rack bar also moves the knockout lever, and thus the three operations of cutting, carrying and knocking out of the die are accomplished by this one rack bar and only one cam, which is cast solid to the balance wheel.

Another new feature of the machine is the pendulum, against which the blank is guided or steadied until it is forced into the die; this pendulum can be adjusted to favor the blank and control the blank, making all the heads come central. This pendulum is also adjustable to the different sizes of wire by the tension, as desired.

All the motions are short, for speed and power, the action is very rapid and the simplicity of all the parts enables the operator to quickly adjust the same and to make the tools in a simple manner, dispensing with the usual outfit of other machinery.

These machines are adapted to all classes of "single-blow" work, constructed with a view to operating on upper floors of buildings with least possible vibration.

By referring to the cut it will be seen that the machine is substantially built and set at a slight angle to enable the operator to see into the parts without stooping. This angle adds considerably to the life of the machine, as it causes the small pieces of wire, scale, &c., to work off freely, instead of lodging in the working parts and causing accidents and wear, as is frequently the case on the horizontal style.



Solid Die Rivet Machine.

No. 1 machine is run at 300 revolutions and will make up to No. 9 wire ¾ inch long.

No. 2 machine runs 200 revolutions and will make up to No. 5 wire 1¼ inches long.

Three of these machines at the above works are producing 5 tons of rivets per week from No. 11 to No. 5 wire.

The Falls Hollow Staybolt Company of Cuyahoga Falls, Ohio, issue a circular calling attention to the special features of their patent mandrel-rolled hollow staybolt iron, as adapted to use in the manufacture of bolts for fire box boilers. They publish a long list of railroad companies using this iron for their locomotives, as well as the names of prominent locomotive manufacturers and boiler makers. With reference to their method of manufacturing staybolts the company say: "We manufacture them of the best charcoal iron (long experience having proved it to be the best material procurable for this important purpose), which, together with our process of manufacture, enables us to produce a staybolt entirely seamless and absolutely free from all defects A few railroad companies drill their bolts, believing it to be a cheaper plan. This is not only expensive, but also very unreliable, for a great many times through the carelessness of the operator the hole is not drilled far enough to attain the object in view, and should the bolt not break near the outside wall sheet it would not indicate fracture. It has been clearly demonstrated that the tensile strength of a hollow bolt of our manufacture, 1 inch out side diameter with ¼ inch hole, will stand a greater strain than a solid bolt of same diameter."

Universal Swing-Frame Grinding Machine.

The accompanying cut represents a patent universal swing-frame grinding machine made by Albert L. Colburn of New Haven, Conn. It is intended for grinding sunken dies used in drop forging, finishing bottle molds, dies for stamping hollow-ware, &c. Dies being hardened oftentimes spring out of shape and have to be ground out by hand with emery and oil. Sometimes they spring so much that they have to be annealed, worked over and hardened again, to spring possibly in a new place. These processes are not only expensive and unsatisfactory, but are quite tedious. By the use of this grinding machine a large part of this work can be done in a short time, also a great deal of chipping and filing on dies in the course of construction before hardening, can be avoided. The machine is designed to be put up so the emery wheel comes over a bench on which the die or work to be ground is placed, the work remaining stationary while the operator moves the wheel over the parts to be ground. The overhead part of the machine needs but little description, save that the belt running from the countershaft to the suspended shaft runs on flange pulleys, so that a joint in the connecting frame near the suspended shaft allows the suspended shaft and pulleys to cant over, giving the emery wheel a range of motion to the right or left a foot or two. The yoke which spans the suspended pulley and holds the vertical rod is hung on pins or joints; also, the vertical shaft has a swivel joint in the yoke directly under the suspended pulley, allowing a back and forward as well as a twisting motion to the emery-wheel spindle. At the lower end of the vertical rod are two guide pulleys whose shafts run in hardened steel bearings, over which the vertical round belt passes on to the driving pulley attached to the spindle. Each side of this driving pulley and attached to the frame are the bearings for the spindle; the outside of these bearings constitute the handles by which the wheel is operated. The spindle has a taper hole in one end, so that arbors of different lengths or sizes can be inserted, also end wheels. By the combination of the guide wheels and the spindle driving pulley in separate holders the emery wheel can be raised or lowered, as indicated by the dotted lines, thereby giving the emery wheel a universal motion. A vertical belt is liable to be loose around the lower pulley, but in this machine the belt is tight at all times when working around this pulley, and it is impossible to slip the belt, however hard the work may be.

UNIVERSAL SWING FRAME GRINDING MACHINE.

The two Cape Cod ship canal companies, who have heretofore been rivals, are now agreed, and seek an appropriation from the General Government to forward the work, also a guarantee from the State.

Progress of this Country.

At a banquet given by the Board of Trade of Columbus, Ohio, to the members of the General Assembly, Governor McKinley responded to the toast, "Ohio and the Nation's Progress," in the course of which he said:

Ohio had but 60,000 inhabitants when she was admitted into the Union. She had in 1890 3,672,316, equal almost to the entire population of the United States in 1790. She was the seventeenth in population when she was admitted into the Union in 1803; she is fourth in 1890. She has constantly increased in population and maintained her increase while at the same time contributing her sons to open up the waste territory and found new States in the far West. Ohioans go to new fields and they do not leave deserted the old ones.

The center of population of the United States is advancing westward and has moved 505 miles toward the Pacific Coast since Washington's administration. Then it was 23 miles east of Baltimore. At the beginning of the decades of '70 and '80 it was in Ohio. It is now 20 miles east of Columbus, Ind., near the village of Westport, Decatur County, but near enough to Ohio to still claim it.

Our national progress is the marvel of the world. In 100 years we have advanced as a nation to first rank in manufactures, agriculture and in mining. Our domestic trade surprises ourselves and all mankind, and our foreign trade is ever increasing in volume and extending to every mart of commerce. With a war debt in 1867 almost appalling in amount, we have paid off at the rate of more than $62,000,000 a year, $174,000 every day for 25 years, and we have a credit in the wide world today in State and nation without rival.

The greatest progress in the last decade has been in the South. Its development has been phenomenal. In 1880 her cotton mills numbered 142; in ten years they have doubled. In 1880 their mills consumed 180,000 pounds of cotton, and in 1889 500,000 pounds. In 1880 the South produced of pig iron 350,000 tons, and in 1889 1,780,000 tons. In 1880 the coal mined in the South was 2,000,000 tons, and in 1889 13,000,000 tons. In 1880 the total value of manufactured products in the South was $3,200,000, and in 1889 it was $30,000,000. Who does not rejoice in this splendid prosperity throughout the South and the almost matchless advancement which this only recently wasted section of the country is making in industrial pursuits?

It is said that the works of Pierce, Butler & Pierce will be removed from Geneva, N. Y., as the result of the inadequate police protection during a recent strike at their works. The strikers objected to the piece-work system of pay, and did considerable damage to property and maltreated workmen not in sympathy with them. The protection afforded by the police was insufficient to prevent the strikers from doing damage to the company's property, and it is to avoid a repetition of a similar occurrence that the company propose to seek another location.

The last report of the Bureau of Statistics, for the fiscal year ending June 30, 1891, gives some detail figures which the monthly statistics do not show. Thus the pig iron imports, which aggregated 81,979 tons, included 54,238 tons of ferromanganese and spiegel and 434 tons of ferrosilicon. In 1890 the imports of manganiferous material footed up to 108,771 tons, out of a total of 148,070 tons. In bar iron the imports of charcoal bars, billets and shapes fell off from 26,921 tons in the fiscal year 1890 to 17,910 tons in 1891. The imports of beams, girders, columns and posts were 4,848,713 pounds in the fiscal year 1890, against 6,954,943 pounds in the fiscal year 1891. In tubes, flues and pipe the importations increased from 701,314 pounds, valued at $149,177, to 3,543,801, valued at $355,895. The imports in car and railroad wheels and tires fell off from 8,247,580 pounds, valued at $265,678, to 5,821,892 pounds, valued at $194,086.

NEW PUBLICATIONS.

HISTORY OF THE MANUFACTURE OF IRON IN ALL AGES. By James M. Swank, general manager of the American Iron and Steel Association, Philadelphia. Second edition; Royal octavo, 574 pages, bound in cloth. For sale only by the author. Price, $7.50

This is emphatically a great work. It is a most valuable contribution to the literature of the iron trade. Unlike very many publications, the value of this work will grow from year to year, as between its covers are preserved authentic narrations of the incidents connected with the development of the several processes now in use for the production of iron and steel, and particularly their introduction into this country. As a part of every well-equipped reference library, this book is indispensable. Nowhere else will be found in such accessible shape more than the merest fraction of its contents, while a great deal of what it contains has been secured by personal communications with those whose achievements are here recorded, and of these not a few have passed away since the author began the collection of his materials. This has been a prodigious task, the extent of which can be but faintly estimated by those who glance through the book and take little note of the innumerable facts that have been laboriously put together to complete the history. Just such a careful, precise, conscientious, painstaking and indefatigable worker as Mr. Swank was needed to perform such a service for the iron trade as this. For 20 years he has been the animating force of the American Iron and Steel Association, and in that time has given to the country the most complete series of statistical reports ever made for a manufacturing industry. Rarely does it happen that statistical work of so comprehensive a character is undertaken by private enterprise. His reports are models of their kind and they are everywhere accepted as "official." Their reputation has been gained solely through the persistent energy with which Mr. Swank has sought to make them absolutely accurate. Those who know him best know that he takes nothing for granted. He jumps at no conclusions. If it were possible to verify every report of production made to him by an iron or steel manufacturer he would unhesitatingly apply himself to the task. The application of such a mind to the collection of historical facts invests the work with more of authenticity than if it had been attempted by one with only the qualifications of abundant leisure and a taste for historical research, or by another with an ambition to have his name connected in some way with the great iron industry.

The book under review is a second edition of the work issued in 1884 by the same author, but it is not merely a reprint. Much of it has been rewritten, many additional historical facts of great interest have been incorporated in the original text, and several entirely new chapters have been made a part of the work. It is especially enriched in its personal allusions. The author has evidently a deep interest in the actions of his fellow men, and is more apt to trace the credit of a new process or the development of the resources of a locality to the several individuals directly or remotely connected with it than to enter into technical details as to the former or to advance scientific theories as to the latter. Personal reminiscences are his delight. Chapters are devoted to the connection of the Washington and Lincoln families with the manufacture of iron in colonial times, which are in themselves important contributions to American history in general. Those who take this book up for the first time, and glance over its pages with some interest in the account given of the early use of iron by mankind, will be impressed by the very great antiquity of the iron working craft. Yet as they read on they will observe how very slowly iron come into anything like common use. There was some skill shown at an early day in the world's history in the manipulation of wrought iron, but how modern is the art of producing it in any considerable quantities. It is hard to realize that so late as during the reign of Edward III of England the frying pan and other kitchen utensils were classed among the king's jewels, and in 1317 the Scotch invaders of England carried off iron bars as the choicest plunder, having none at home. Harder yet is it to realize that cast iron is a very modern discovery, not known until about the beginning of the fourteenth century of the Christian era. When in connection with the very slow growth of the iron trade for thousands of years Mr. Swank marshals the facts attending the wonderful progress of this country in the past 50 years, it seems as though the manufacture of iron and steel is really a modern industry; modern it certainly is with regard to the production of iron and steel in any considerable quantity. But above all how interesting is the fact that the author of this important book has been permitted to round out his work of revision by recording the triumphant advance of the United States to first place among the iron and steel producing nations of the world—a position secured by such a strong lead that no competition for the honor will hereafter be recognized.

Transcontinental Freights.

At a meeting of the Pittsburgh committee of the freight agents representing the various lines of that city, held last week, it was agreed to adopt a differential rate to San Francisco only by the Canadian Pacific route. The rates from the Pittsburgh district under the differential went into effect on Monday, the 22d inst., and are less than the established rates by Transcontinental lines, the difference being shown in the following figures, the quoted differenal being per 100 pounds: First class, 22 cents.; second, 18 cents; third, 15 cents; fourth, 12 cents; fifth, 12 cents; class A, 10½ cents; B, 10½ cents; C, 8 cents; D, 7 cents; E, 5 cents. Important action was also taken in regard to the uniform bill of lading matter. The Pittsburgh lines, represented by the freight agents, agreed to break over the old established rule in regard to requiring a uniform bill of lading, and resolved to leave the matter to the individual lines to accept such forms of bill of lading as may be satisfactory to each, provided the form consists of the conditions required on the uniform bill. It was further decided that the present rates on skelp iron shall apply to iron and steel, nail plate and tack plate, and tin plate bars, the changes having gone into effect on Monday, the 22d inst.

The work of laying the Jupiter-Nassau cable was accomplished with remarkable dispatch. The cable is 230 miles long, and it required but a fortnight to carry it across Jupiter Inlet and pay it out from there back to Nassau.

The Preservation of the Hearth and Bosh Walls of the Blast Furnace.*

BY JAMES GAYLEY, BRADDOCK, PA.

The lining of the hearth and bosh of a blast furnace has naturally come to be considered its weakest part, being subject not only to abrasion, but also to intense chemical action. In order to provide against rapidity of wear, it was formerly customary to build the lining from the mantle to the top first, and to put in afterward the hearth and bosh, drawing the latter into a recess that had been reserved for it in the upper lining. At some works this practice still prevails: but through the progressive development of cooling devices it has become possible to protect the bosh so well as to make it the most durable part of the furnace. The main question now is, by which one of several methods the best economy results can be obtained. The plain bosh jacket, made of wrought iron or steel, and frequently called the air-cooled jacket, was a great improvement over the crinoline construction formerly in vogue; but it was difficult in many cases to persuade furnace managers that in order to secure its best effects they must discard the thick bosh walls and put in comparatively thin ones. John M. Hartman, who did more perhaps than any one to extend the use of these jackets, invariably contended for a 13-inch wall, the thin wall being an essential part of this construction Later, a coil of pipe was placed just inside the jacket, through which water circulating freely contributed further to the proper maintenance of the walls. Undoubtedly much better results have been obtained in practice where the iron jacket has been supplemented by a coil in this way. It is safe to say that this combination of water coil and jacket is much better than external sprays on the jacket; but it does not prevent the brick work from cutting entirely away, which enlarges the bosh to that extent and interferes with the economy and output of the furnace. In case of leakage or stopping up of the pipes, they cannot be replaced. A leading blast-furnace manager who is now using this construction advises me that "while the furnace is not particularly unsatisfactory, yet the fuel consumption is much higher than that of a year ago, and the product less." Such, in fact, has been the common experience of users of this arrangement. On the other hand, there is nothing else that has proved so durable a protection for the bosh in the manufacture of ferro and spiegel, both of which are unusually severe on the lining. Nevertheless, I believe it is generally agreed that in a furnace making pig iron, a cooling plate or box inserted in the brick work will not only afford equal protection against breaking out, but will prove more economical.

It is not the purpose of this paper to give a complete history of the various stages in the development of cooling arrangements for protecting the bosh, but principally to point out some of the prominent features of those that are now used.

Among the first plates that came under my notice were those used by Joseph Hunt at the Crane Iron Works in 1877, a section of which is shown in Fig. 1.

Each of these plates was an iron casting, containing a single coil of pipe, located near the inside edge. They were cast in segments, and were made to serve, by means of the projecting edge, the double purpose of coolers, and binders to the brick work. They were built in flush with the outside of the lining. The water pipe did not extend in as far as is now customary, and hence, as the cooling was done nearer to the outside of the lining, not so much benefit was derived as if the pipe had been placed further in; yet even from this inefficient arrangement much advantage was realized.

Another form much used had a snake-shaped coil in the casting, cooling more of the sectional area.

The importance of a durable bosh wall, requiring the cooling agent to be closer to the inner edge of the wall, led to the employment of the two-arm cast-iron plate, shown in Fig. 2.

In order to have a reserve waterway a second pass was added. These passes were coupled together, and in many cases the water circuit was through two plates. Unless the water is pure and free from sediment, this kind of plate is not very durable. It frequently happens that quite early in the blast the inner coil is destroyed; and although the water is kept running through the outer one, yet the furnace lines are widened out, and an irregular shape is given, depending on the position of the destroyed passes.

From the success of the bronze over the iron tuyere, it was a natural inference that a bronze bosh plate would in the same manner surpass one made of iron; consequently, a two-pass bosh plate was made by Best, Fox & Co. of Pittsburgh, from the designs of Julian Kennedy, and built into the bosh of one of the Lucy furnaces. About this time, or a little earlier, other experiments were made in the direction of using copper and bronze for bosh cooling. In 1884 Mr. Cremer equipped one of the Edgar Thomson furnaces with cooling plates inserted vertically around the bosh, only one row being used. Some of these plates consisted of cast iron, inclosing a single copper tube; the others were hollow boxes of copper-bronze, 4 feet long, 2 feet wide, and 3 inches thick on the outside; if I remember rightly they were given a slight taper. These plates and boxes were inserted alternately in the vertical slots in the iron bosh jacket, and were held in position by suitable fastenings at the top and bottom, in such a way that they could be readily removed. I had an opportunity of seeing one of each type removed. In that one having the copper pipe, about half the cast iron had been melted off, and the coil had sagged down along the bosh wall, affording little or no protection against the cutting back of the walls. On the other hand, the bronze box casting was taken out in perfect shape and was easily withdrawn. It showed in a marked degree the superiority of a bronze waterway over a coil in cast iron. This test showed besides, that vertical plates are not suited for cooling purposes; for the boshes were corrugated vertically.

In the two-pass plate designed by Mr. Kennedy the waterways are simply openings in the bronze casting, no coil being used. These plates are placed horizontally in the brick work in rows about 2 feet apart, and connected singly or together, according to their location and the head of water. The frequent losing of the inner pass in the two lower rows not only permits the furnace to widen out considerably, and at the same time irregularly, but on account of their irremovability (without cutting a large mass of brick work away) a great loss ensues through the waste of bronze metal, my experience being that not over 40 per cent. of the bronze was obtainable at the end of the blast. Nevertheless, the bronze plate was in every way more economical than the iron coil.

Two separate cases have come under my observation in which two furnaces of the same design and capacity were working side by side, one equipped with the iron-coil arrangement, the other with bronze plates. In both cases the furnace having the bronze showed much more economical results than the other, both in fuel and product. It may be argued that two furnaces of the same dimensions, using the same stock, and even identical as to all parts of their equipment, will always give diverse results. This is in a great measure true, but I contend that with the steady progress of our practice it is becoming less true every year; and if we except a certain individuality which seems to belong to all furnaces, we may expect to see it disappear.

Concerning the comparative effect on furnace walls of bronze and iron-coil plates, I would mention a case in which our furnaces were banked for several months. On cleaning out the hearth, preparatory to starting up, it was found that through the gradual combustion of the coke the ore in the charge had fused into a large, compact mass, and was suspended from the top of the bosh. This mass was in the shape of an inverted cone, and securely held the stock above, thus presenting a complete view of the bosh walls. It was found that the bronze plates extended about 4 inches through the bosh coating, and had preserved their horizontal position, as shown in Fig. 3 on the side marked "A", proving that in operation the furnace lines had been uniformly maintained. In the case of the iron-coil plates, it was found that although water was passing through the inner coil, all the cast iron had been melted off up to the second coil, and, as is shown on the side marked "B," the inner coil was hanging down almost beneath the other, widening the furnace to that extent. This demonstrated conclusively that while, from an external point of view, the indications of efficiency (*i.e.*, the passage of water through both coils) were present, yet they were not proof positive of the preservation of the bosh walls. In these cases the wall between the plates is shown to be cut back, making horizontal corrugations This condition does not exist, however, when the furnace is in operation; since these cavities are then filled with carbon and cinder material out to the edge of the plate, which determines the straight line of the bosh.

The changing of the furnace shape through loss of waterways in the plate, and, in addition thereto, the great waste of metal occasioned by such loss, has naturally resulted in a demand for a horizontal plate that can be withdrawn.

Fig. 4 shows a furnace equipped with a bronze bosh-cooling box, designed by C. Fronheiser of Johnstown, and used for the past ten years at the Cambria Iron Company's furnaces, where it has given satisfaction. This is an ingenious arrangement whereby the waste water from the coolers is used for cooling the bosh. The boxes are made tapering on the sides and top for the purpose of easy removal. The waste water from the cooler is carried up through the vertical pipe and discharged into a 2-inch circular main above the topmost row of boxes; from this distributing main it flows into the upper boxes through an opening at the bottom, discharging through an opening at the top into the next lower course, and so on. A main supply is provided, in case more water should be needed than is obtained from the tuyeres. It is claimed that leaks are readily detected, as the back of the boxes is open at the top. The water being used at low pressure, not much would penetrate the furnace even in case of a leak. These boxes are built in the bosh, when the bracing is done with steel rails bent to conform to the slope of the bosh; and also when the bosh is held by an iron jacket, openings being cut wherever necessary for the insertion of the box.

Another form of cooling plate, shown in Fig. 5, was designed by James Scott of the Lucy furnaces, Pittsburgh, and is now being built in one of their furnaces.

* Read at the Baltimore meeting of the American Institute of Mining Engineers.

This plate combines the removable feature of the Fronheiser box and the high pressure water feed of the two-pass bronze plate. By a reference to Fig. 5 it will be seen that the cooling surface extends the full length of the plate, the course being interrupted by baffles to induce a more rapid current for efficient cooling. The top of the plate is curved and tapers toward the inner edge. The inclosing brick work is patterned to the curvature of the plate. Mr. Scott claims in his patent specifications that "the destruction of bosh plates has not been due so much to burning as to the manner in which they have been set in the walls, it being the practice to build them in the wall with the bricks bearing directly on them from above and at the sides, so that when the brick work expands by reason of the heat of the furnace, it strains and breaks the bosh plate." In order, then, to relieve the plate from any pressure, an arch is sprung from a skewback between the plates, of such radius as will be necessary to conform to the curvature of the top. The space between the plate and the arch is filled with a packing of fire clay. The bricks used here are preferably made in special shapes, and while making a strong arch, also contribute to the ease and rapidity of construction. A heavy iron band, passing over the top of these arch bricks, holds them securely in place. Five rows of these plates will be used at the Lucy Furnace; and although they have not had thus far a practical trial, yet they have been carefully designed and will give good results. The construction will permit the easy removal and rapid replacement of a plate when necessary from any cause

Fig. 6 shows a cooling plate of my own design, prepared to meet the requirements at the Edgar Thomson furnaces It is wedge shaped, with plain surfaced top and bottom, the waterway being confined to the inner half of the plate and made 10 inches wide, providing a large amount of cooling surface; the outer half is open and divided by webs, which support the upper side of the plate. It is unnecessary to extend the waterway any further back, since frequent observations of the bosh wall have shown that this is sufficient to cover the highly heated section. In the water chamber are vertical studs for supporting the upper side, although I question much if this is necessary, as the bosh brick work is so well set and firmly braced that when we have had occasion to change some of the two pass Kennedy bronze plates we were unable to cut an opening extending 7 feet around the furnace, and of the width of three bricks high, in which the upper course remained intact. No special brick are required; the common 9-inch and 13-inch brick, such as we ordinarily use for our furnace linings, answers the purpose in every way.

In a furnace newly lined and put in blast in May, 1891, the two lower rows were fitted with these plates (which were made by Best, Fox & Co. of Pittsburgh), and in another furnace, blown in in the following June, the three lower rows were fitted in the same way, the upper rows being supplied with plates of the old pattern that we had on hand. In January, 1891, three of these plates were first used in repairing an old furnace, and since then we have used them extensively in repairing our other furnaces. At the present time we are using them in six of our furnaces, and out of the number used we have had to change three on account of leaking, the time of removal occupying from 20 to 25 minutes, and no trouble being found in inserting the new plate, as the brick work remained intact. A fact worthy of notice is that the plates found leaking were invariably in an old furnace that had been repaired, the reason, I presume, being the difficulty of getting a substantial support at the inner side in an old wall. In cases where these plates were built in at the time of relining we have never had the least indication of a leak. This has also been the experience elsewhere. One of the furnaces of the Cleveland Rolling Mill Company, Cleveland, Ohio, was blown in August 1, having been equipped with these plates above the tuyeres. Mr. Mokate, the superintendent, writes me that "on account of bad water these plates were used above the tuyeres, where they would be subjected to the most severe test. The water was not only muddy, but besides was oily from the discharge of the Standard Oil Company's sewer. With all this to contend against we have not lost a plate, nor have we had any trouble with them in any way. During this blast the furnace has worked exceedingly well, having both increased output and low fuel consumption."

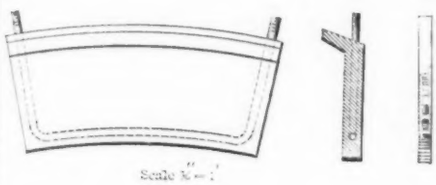


Fig. 1.—*The Hunt Bosh-Cooling Plate.*

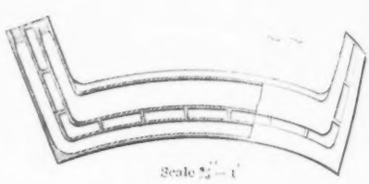


Fig. 2.—*The Kennedy Bosh-Cooling Plate.*

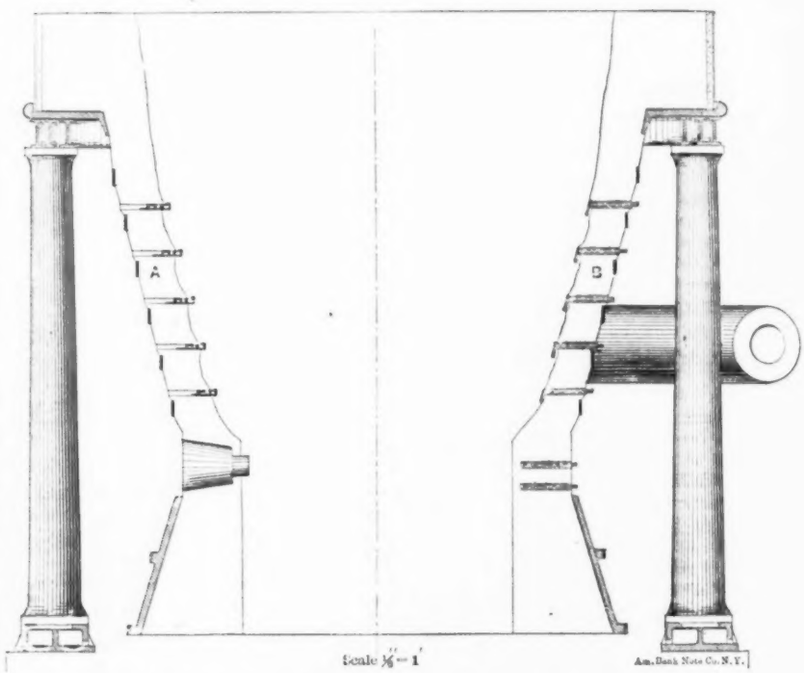


Fig. 3.—*Sections Showing Effect of Wear on Bronze* (A) *and Iron* (B) *Cooling Plates.*

As already observed, this plate is provided with only one waterway. The back space could be converted into a waterway, but it is unnecessary; in fact, the value of a two-pass plate is delusive. Theoretically it is a splendid thing to have a course in reserve when the inner one has become destroyed; but with the destruction of the inner course there follows not only a change in the shape of the furnace, but also the loss of a considerable quantity of valuable bronze. In fact, a plate without any reserve force is particularly to be desired, as it necessitates an immediate withdrawal. In many cases the withdrawn plate can be plugged and reinserted, as is frequently done with tuyeres. In building these plates into the wall the exposed side can be left open, as shown at "A," or if desired to preserve the continuity of the brick work a few loose bricks can be inserted, as at "B," but these bricks are no part and contribute nothing to the strength of the walls. This plate can be withdrawn by means of an extemporized screw jack, applied in the manner shown in Fig. 7.

Although the first cost of bronze plates is somewhat greater than that of iron the difference is covered many times over by increased economy. Before the introduction of bronze plates the usual experience as to fuel consumption was a minimum quantity at the commencement of the blast, gradually increasing until at the end it was abnormally high. On the other hand, it has been a common experience where the walls were equipped with bronze cooling plates that the fuel consumption at the end of the blast was very little in excess of that at the early part.

There is much difference of opinion with regard to the hight above the tuyeres at which bosh plates can be used with advantage. We have not placed them above 12 feet at the Edgar Thomson furnaces, but they have been used higher at other works with good results.

Besides the use of cooling plates for the preservation of the bosh, the bricks themselves are a matter of equal importance. In recent years there have been changes in design and method of construction, but very little in the brick material. This, I think, is proper enough, as the fire clay bricks now available are about as good as can be made. Moreover, very little depends on the durability of the brick. I question very much whether the bricks in any lining would last a week were they subjected directly to the tre-

mendous scouring action of the cinder that prevails in the bosh inclosure. It is a well-known experiment that if a fire brick, such as is used in the bosh, be suspended in the cinder runner, and a hot flush of cinder allowed to run over it, it will be found to dissolve about as readily as does sugar and water. The fusibility of fire brick in the blast furnace was brought to my attention in a very marked way, on one occasion, at the Edgar Thomson Works. It was reported that the top lining of one of our furnaces appeared to be worn through. The stock was immediately lowered about 30 feet to make an examination. On looking into the furnace it was found that at 25 feet from the top the fire-brick lining was worn through to the 9-inch wall of red brick put in as a back lining, and was resting entirely on the stock, and moving down with it. Arrangements were made at once to withdraw the contents of the furnace through the tuyere openings. A large force was put on, working night and day to get the material out as quickly as possibly. We were expecting to have trouble with a large mass of semi-fused brick; for while the lining was worn through about 25 feet down, yet the upper part was in very good shape, and the drawing in to fit the hopper had required a large mass of brick work. At the end of two days we had the furnace emptied to the tuyeres, and, much to my surprise, not a sign of brick was seen. There was nothing to suggest anything different from emptying a furnace under ordinary circumstances. The bricks had readily melted, and had probably fluxed some of the lime or basic material in the charge, making them indistinguishable. This occurrence showed how readily unprotected fire brick could be destroyed in the hotter portion of the furnace.

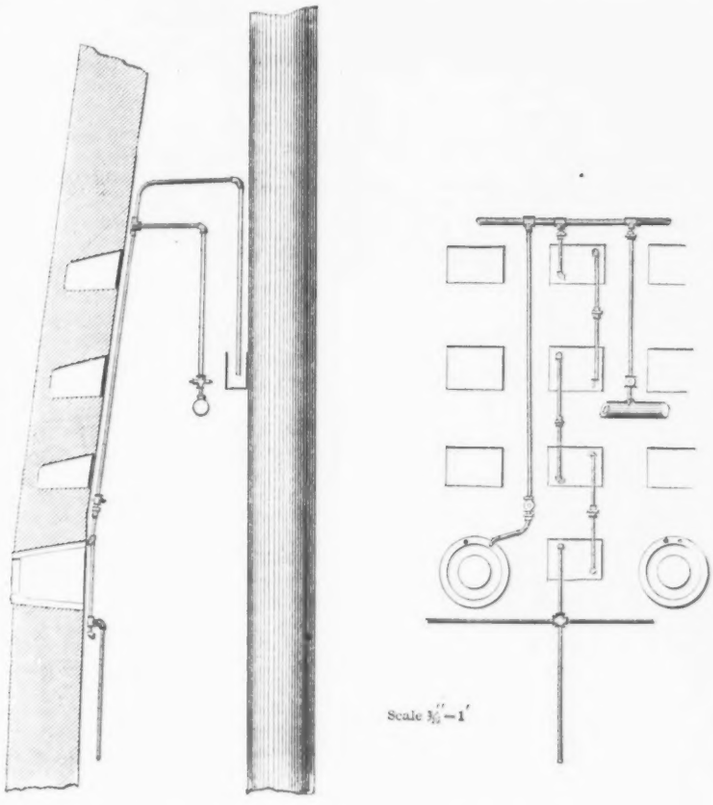


Fig. 4.—The Fronheiser Arrangement of Cooling Boxes.

It is through the protection afforded by carbon that the bricks of the bosh are thoroughly preserved. Simultaneously with the commencement of the smelting operation, there is deposited a coating of carbonaceous material on the walls, which, as the process advances, replaces the brick to the depth of several inches; and investigations have shown that this substitution is best promoted through the medium of a basic cinder. This may explain, in a measure, a common saying in the anthracite iron district, that "it is best to blow in hot and limey."

This coating of carbon material is also exceedingly tough and durable. We have frequently cut out the brick work to replace bosh plates (of the two-arm pattern, built in the wall), and have invariably found this material far more difficult to penetrate than the bricks, showing that it is valuable not only as a protective covering, but as contributing materially to the strength of the wall.

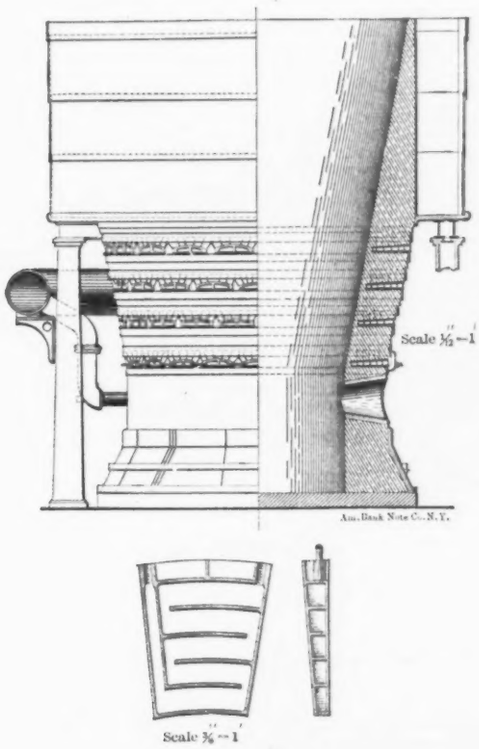


Fig. 5.—The Scott Arrangement.

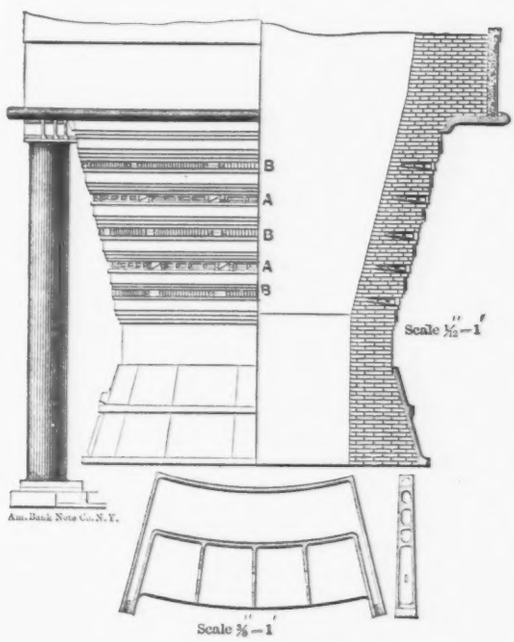


Fig. 6.—The Gayley Arrangement.

It has been frequently observed by blast furnace managers that under certain circumstances the bosh would "build up," and that during this period the results would be surprisingly good; while, subsequently, owing to the widening out of the

bosh by some cause, the results would be quite inferior.

On blowing out a furnace, it is invariably the case that the walls are found protected with a carbon coating, and it would appear that this carbon substitution is done very thoroughly at an early period in the blast. My attention was first called to this point in 1878, when No. 5 furnace of the Crane Iron Company was blown out for

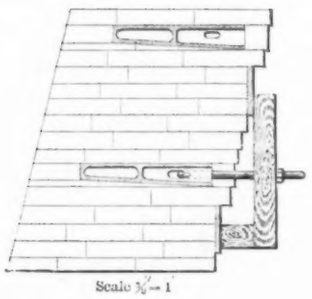


Fig. 7.—Arrangement for Removing the Gayley Plate.

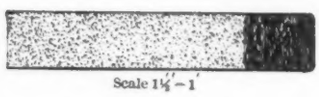


Fig. 8.—Fire Brick.

some cause after a blast of less than a month; and it was found that the carbon substitution was as thorough in the hearth as after a blast of three years, but not to the same extent along the bosh.

In 1890 I had some samples taken from two furnaces that we had blown out, the results of which are as follows:

	I. One sample.	II. Average of two samples.	III. Special sample.	IV. Average of six samples.
Carbon	Per cent.	Per cent.	Per cent.	Per cent
Silica	46.62	28.15	23.79	35.75
Iron	17.50	22.05	26.57	24.70
Alumina	5.12	2.01	16 40	4.78
Magnesia	7.07	8 63	8.71	10.89
Lime	3.01	3.76	2 85	6.78
Calcium sulphide	15.78	27.63	17.96	14.22
	2.35	2.89	3.76	2.85

Nos. I and II are from one furnace; III and IV from another.

From this it will be seen that the limits in carbon are from 23 to 6 per cent., with an average from all the analyses of 33.58 per cent. Analysis No. IV embraces more samples and is, therefore, more representative than either of the others.

In October, 1891, Furnace A, having sheared the rivets half way round on one seam of the jacket, and leaning over to such an extent that it was impossible to remedy it, was dismantled preparatory to erecting a new stack. In the process of tearing down the lining it was noticed that the bricks in the upper part of the bosh had on their exposed ends a substitution of carbon material to the depth of over 2 inches. The bricks, as shown in Fig. 8, were of standard length, and the dividing line between the carbon and the clay was well defined. The material had the appear and consistency of plumbago. An analysis of it showed as follows:

	Per cent.
Carbon	35.71
Silica	20.90
Iron	4.50
Alumina	7.71
Magnesia	3.26
Lime	3.12
Barium oxide	1.01
Sulphur	0.24
Manganese	17.70

The presence of such a large quantity of manganese is due to the fact that the furnace was making ferromanganese at the time. Comparing this with analysis IV, given above, it will be seen that the carbon

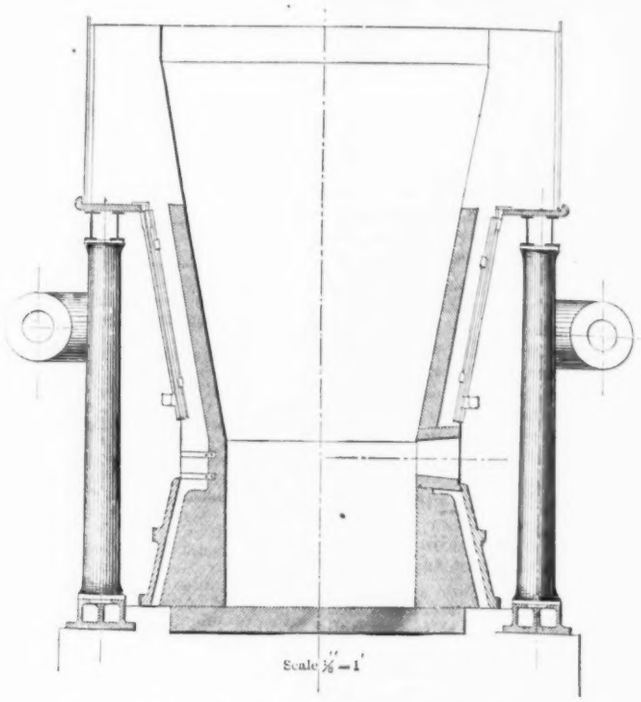


Fig. 9.—Edgar Thomson A, with Carbon Brick Lining.

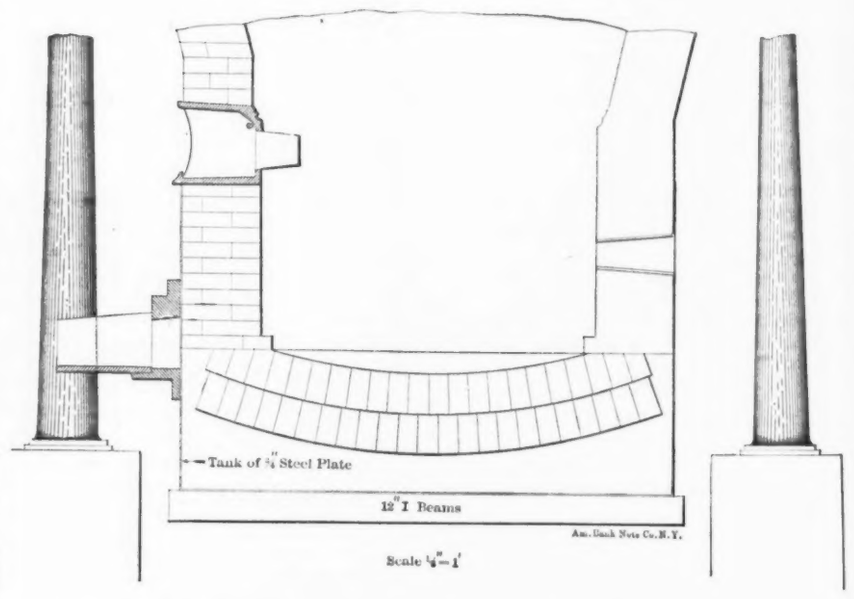


Fig. 10.—Furnace Hearth Inclosed in Steel Tank and Resting on I Beams.

percentage is identical. In appearance, however, the samples of IV were more like coke than plumbago.

In 1890 we used some bricks made of fire clay and graphite for repairing a badly worn spot in the bosh wall of one of our old furnaces where previously it had been difficult to get any kind of fire brick to stand, the result being that we had no more trouble with it during the blast. Arrangements were subsequently made with Harbison & Walker of Pittsburgh to furnish us with carbon brick in sufficient quantity to reline a hearth and bosh. A considerable time was spent in experimenting with bricks of a great variety of compositions and requiring different treatment. As a result of this thorough testing they have been able to make a very superior quality of carbon brick. Three different kinds of brick were furnished, viz., graphite and clay, coke and clay and coke and tar. These brick have been built in the lining of Furnace A, as shown by the shaded portion of the drawing in Fig. 9. In order to make a test of the different kinds of carbon brick the bottom of the hearth was built of those made of graphite and clay; while along the hearth wall and bosh there were used those made of clay and coke and tar and coke, each being placed in a separate location for the purpose of testing its durability. The material used

for joining the bricks was a mixture of fire clay and ground coke. It was the intention to build the bricks clear out to the jacket, but the supply on hand would not permit such extensive use. The carbon-brick lining along the bosh was therefore made 9 inches thick, and was carried up a distance of 12 feet above the center line of the tuyeres.

In the drawing, the unshaded portion represents fire brick. The analysis of the coke bricks are as follows:

	Coke and clay. Per cent.	Coke and tar. Per cent.
Carbon	64.23	87.26
Silica	21.51	.....
Oxide of iron	1.41	.....
Alumina	12.05	.....
Lime	0.67	.....
Magnesia	0.29	Ash 12 74
Total	100.16	100.00

In order to protect the carbon bricks during the periods of drying out and blowing in, a wall of 9 inch fire clay bricks, placed on edge, was built in front of them.

In Germany, carbon bricks have been used for the construction of the bottom and hearth walls up to the tuyeres, the practice being to use bricks and blocks, and in some cases to ram the carbon material in. Hitherto the practice has been not to extend these bricks above the tuyeres; but at the Gelsenkirchen Furnace, which was to be relined last year, it was proposed to build the bosh with carbon brick. They have proved very beneficial in preventing break-outs of iron and cinder; in fact, since the use of them began no break-outs have occurred. Although the hearth cooling jacket is not dispensed with, yet the indications are that it will be, as no water is required for cooling except at the tuyeres. In some furnaces where the carbon bricks are used the hearth stands free, being inclosed in a steel tank and supported on I-beams, as shown in Fig. 10. In fact, one can crawl under the bottom if he so desires. On account of not using water around the hearth, and not having break-outs, a comparatively safer practice is obtained; and besides, there is no troublesome salamander to deal with after blowing out.

While these carbon brick are serviceable in the hearth for the reasons above given, I consider that their greatest value will be realized from the use in the bosh, contributing to the regular working of the furnace, and the attainment of low fuel economy. When the bosh walls are in good shape the best work is obtained, and the converse of this is likewise true.

Note.—At the present time our Furnace A is being dried out, and we shall be in a position later on to speak more definitely on the practical use of carbon brick.

The Berlin Iron Bridge Company of East Berlin, Conn., have taken the contract for a new boiler shop for the Dry Dock Engine Works, at Detroit, Mich. The building will be 68 feet in width by 201 feet in length, and the Berlin Company will design and build the whole building complete ready for the machinery.

United States Consul Newell, at Managua, has informed the Department of State that the new tariff of Nicaragua, placing a duty of 100 per cent. ad valorem on all importations, which goes into effect April 19, will prevent any increase of trade with the United States, if it does not entirely keep out importations from that country. He says that local merchants say that American manufacturers cannot hope to compete with the English and German manufacturers in the Nicaraguan markets so long as they maintain the present prices of their goods and the present exorbitant freight rates prevail.

WORLD'S FAIR NOTES.

An Important Dispute Ended

The contention between the National Commission and the local directory as to which body shall exercise jurisdiction over the transportation, housing, reception and handling of exhibits was settled on the 16th. An agreement was reached at a joint session between J. W. St. Clair and George V. Massey, representing the National Commission, and President W. T. Baker and R. A. Waller, representing the Board of Directors. The joint report on the subject was signed by the four representatives indicated, and it is presumed that President Baker as well as the National Commissioners are satisfied with the outcome.

The following plan of procedure has been concurred in:

1. That the World's Columbian Exposition shall indicate and constitute an authority which shall be clothed with all the powers and prerogatives possessed by that corporation touching that branch of the work of transportation conceded to be exclusively within its jurisdiction.

2. That this authority shall be primarily charged with the duty of negotiating for, arranging and fixing all rates and charges which exhibitors shall be required to pay or be chargeable with touching the transportation of exhibits, as well as all charges for handling, receiving and storage thereof, and shall make a complete and accurate schedule thereof, showing such charges in detail, and submit the same to the Executive Committee or the standing Committee on Tariffs and Transportation of the National Commission and its Director-General for their consideration. When approved by them the same shall be considered as final and authoritative, and shall be forthwith promulgated accordingly. In case, however, they shall not receive the approval, either in whole or in part, of the last mentioned Executive Committee and the Director-General, the matters concerning which there may be disagreement shall be forthwith reported through the Director-General to the National Commission, if in session, or otherwise to the Board of Reference and Control, and these matters shall be treated as subjects of difference between the two bodies and be forthwith determined by the formal action of the Joint Committee of Conference.

3. That the agencies to be employed within the exposition grounds for moving, handling, receiving and delivering exhibits into the several buildings or locations to which they shall have been lawfully assigned for installation, agreeably to the regulation governing the particular department and installation therein, shall be selected by and be under the exclusive control of the aforesaid authority of the World's Columbian Exposition; subject, however, to the supervision of the said Executive Committee of the commission and its Director-General to the extent of enabling them to ascertain and determine as to the adequacy and efficiency thereof, and in the event that they shall consider any such agency or agencies at any time inadequate or inefficient they shall at once confer with the said authority of the World's Columbian Exposition for the purpose of remedying the defect, and if they fail to accomplish it by such conference they shall forthwith communicate their views in this behalf to the National Commission, if in session, or otherwise to its Board of Reference and Control, through the Director-General, and the matters so communicated shall constitute subjects of difference between the two bodies and be immediately settled by the formal action of the Joint Conference Committee, when and as the same may be from time to time presented.

It is thought the directory will adopt the report, inasmuch as it is signed by President Baker and Mr. Waller, who were delegated to perform the service just accomplished. Next arises the question of who will be named by the directory to have charge of handling these exhibits subject to the approval of the Director-General. It is thought that Chief of Construction Burnham will be the man. He has directed up to date the laying of all the tracks which will be used in the installation of exhibits. He has under him a large force of employees and can conveniently combine with the duties of handling construction material the handling of exhibits. The Board of Directors will make all appointments and pay all salaries. Director General Davis will therefore have no particular patronage to bestow in this particular branch of the service. At the same time it will rest with him to approve or disapprove any arrangements made by the Board of Directors.

Norway and Sweden Preparing.

The Government of Norway has asked the Storthing (Norwegian Diet) for an appropriation of 216,000 crowns ($58,320) for Norway's participation in the World's Fair, and private citizens are subscribing to a fund of 40,000 crowns ($10,800) with which will be built an exact counterpart of the Viking ship dug out near Sandefjord, Norway, some years ago. This ship will sail across the Atlantic and through the St. Lawrence River, and will be brought to Chicago. After the exposition it will probably be presented as a gift to the city of Chicago.

The Government of Sweden has asked from the Riksdag (Swedish Diet) an appropriation of 200,000 crowns ($54,000) for Sweden's participation in the fair.

In Norway there has been appointed a royal commission to take preparatory steps for the country's participation in the fair. It consists of five members. Besides this commission the Government has appointed Christopher Raon, Norwegian-Swedish Vice-Consul in New York, a special commissioner, and instructed him to proceed to Chicago and see what can be done in order to have Norway represented at the fair in the best possible manner.

The Government of Norway has also asked for an appropriation of 50,000 crowns ($13,500) to be used as stipends for mechanics who want to visit the fair.

The Bethlehem Iron Company.

Chief Willard A. Smith has received intimation that the Bethlehem Iron Company of Pennsylvania will make a grand exhibit in the Department of Transportation exhibits. This will include steel rails, but the principal portion of their space will be devoted to marine work. A battle ship shafting 125 feet in length, specimens of armor plate, guns, projectiles and various naval appliances will be shown. An armor plate ingot weighing about 100 tons will be an important item. The company will also erect a full-sized model of their famous 125 ton steam hammer, said to be the largest in the world. It will be to all appearances a perfect duplicate in every respect. It will span the main avenue (passing through the building from north to south) and will rise to a hight of 90 feet. At the last Paris Exposition great attention was attracted by a similar model shown by the Creusot Works, but representing only a 100-ton hammer.

Brevities.

It is proposed to show in the railroad division of the Department of Transportation a complete railroad testing laboratory in which will be conducted tests, both mechanical and chemical, with all supplies used by railroad companies. The Department of Transportation will contain some novel exhibitions, showing the practical work in the great workshops of the country. For instance, the process of boat building is to be shown with skilled hand labor, no machinery at all being used, and full-sized boats will be turned out.

J. J. Vickers of London, who represents one of the many English syndicates, was in Chicago last week. He and his associates propose to operate a transatlantic steamship line during the progress of the World's Fair, and will make the rate low enough to reach the means of persons in moderate circumstances. The company will provide comfortable berths and good

meals for a price much lower than the line companies. The port of entry will be Philadelphia.

It is announced that the British railways have agreed to carry the goods of British exhibitors intended for the fair to and from the port of shipment at half rates. The steamship lines have agreed to carry freight at 11 shillings a ton, and have also consented to adopt a reduced passenger tariff for exhibitors and their employees.

On recommendation of the Finance Committee, it was decided last week to make another call of 20 per cent. on stock subscriptions. This assessment is payable on or before April 15, and, being the fourth, will make 80 per cent. paid on the face value of stock.

Director-General Davis has notified the chiefs of the departments that November 1 they would be expected to move to Jackson Park and make their headquarters there until the close of the fair.

THE WEEK.

The British Admiral in the Pacific writes that a suitable steaming coal can be obtained a very short distance from the depot at Esquimalt. Canadian coal and Cardiff coal cost about the same at the Pacific stations.

The Ranney Bridge bill, which has been 15 years before the New York Legislature, passed the Assembly on the 17th inst.

A bridge across the Mississippi River, at Davenport, Iowa, is contemplated; estimated cost, $1,500,000.

Canadians are said to desire the co-operation of the United States in enlarging their canals, and it is intimated that they would gladly arrange with their neighbors for their joint use.

The extensive tract of meadow land on the Jersey City front known as the South Cove Grant, which has been the subject of contention for a long time between the Jersey Central Railroad and the municipal authorities, is now decided by the Supreme Court of the State to belong to the city. The value of the property is estimated at $2,000,000.

The recent Reading consolidation is followed by numerous changes in arrangements for transportation. The entire *personnel* of the Reading officials is changed and the Pennsylvania Railroad, to retain its share of business, is projecting new lines to cover all parts of the Wyoming and Lackawanna valleys to Wilkesbarre, Pittston, Scranton and other towns which have lucrative trade and originate large amounts of freight.

Smoke remedies are being thoroughly discussed in Pittsburgh.

The Governor of the Mexican State of San Luis Potosi, in a special letter on the resources of that region, speaks of the number of new American houses lately established, to whom the Government grants all needed facilities, and the variety of products that offer inducements to enterprise.

Attorney General Hensel of Pennsylvania contradicts false statements respecting the attitude of the authorities of the State toward the Reading Railroad consolidation.

According to Secretary McBryde of the United Mine Workers of America, the membership of the organization has fallen off from 32,000 to 20,000 in one year, due mainly to bad strikes. The loss of membership was in the coke regions, where about $20,000 was spent, and in Iowa, Illinois, Indiana, Pennsylvania and elsewhere where defeat went hand in hand with the loss of members and the expenditure of cold cash.

An envelope trust, capital $5,000,000, is recommended by some of the manufacturers.

The Russian vice-consul in New York explains that the Hebrew exodus to this country is caused by an expectation of participating in the Hirsch fund. Disappointed in this, many desire to return.

The Reading Railroad Company are about to erect powder mills about two miles from Scranton, for the supply of their collieries. The mills will be the largest in the country.

The Canadian commissioners report that they were cordially received at Washington, but cannot speak of results excepting to their superior officers in the Government.

The trustees of the Hirsch fund have purchased 5000 acres of land in the oak belt at Woodbine, N. J., which will be settled by 75 families in the spring. Seventy-five houses are now being erected and plans for a factory have also been adopted.

California farmers are planting heavily with wheat this year and count with confidence on an 800,000 ton surplus next autumn.

An order for gun barrels received in Germany through Paris is said to have the strong disapproval of the Kaiser.

New Orleans is elated by the growth of the export business of that port, compared with last year's. The value of the wheat export from New Orleans during the month of January was $1,891,043; and the value of the cotton was $15,353,661.

Reports come from Nicarauga and Venezuela of a hitch in reciprocity arrangements, and Mexico gives little encouragement.

The affairs of the New York Steamship Company, organized two years ago to run steamships from New York to ports in Maine and Nova Scotia, have been wound up at sheriff's sale. The business is said to have been remunerative, but mismanaged.

It is officially announced that the Canadian Pacific will shortly be made a double track line between Winnipeg and Fort William on Lake Superior.

The New York Maritime Exchange has received official information that steamers carrying oil in bulk may pass through the Suez Canal after June 30 next. The regulations heretofore have naturally favored the large sailing vessels going round the Cape.

Estimates of the cost of improved terminal facilities for the Brooklyn Bridge, both ends included, vary from $7,851,000 to $11,411,000. Four plans are submitted.

The American company formed to dredge the Panama Canal will soon go out of existence.

The New York State Board of Trade has adopted a resolution asking the Legislature to repeal the Saturday Half-holiday law.

The Chicago gas syndicate has purchased the entire Indiana natural gas interests.

The engineer's object that Newark's new water plant, which the Lehigh Valley Railroad promised to give for $6,000,000, is inadequate.

The returns received by the State Commissioners of Labor Statistics in Ohio for 1891 show the cost of materials to have been $121,880,816, the wages paid to labor $53,540,794 and the value of the product $210,720,732.

A new process of cutting boards from a log was exhibited at the Eagle Saw Mill Works, in Brooklyn, last week.

President Lewis, chief owner in the Brooklyn street railway system, who is inquiring into the cost of electricity as a motive power, says they will expend $1,500,000 for engines, generators, motors and other supplies of this kind.

The new Honduras Trading Company, organized in Chicago, will place six steamers between ports on the Gulf of Mexico.

President Hippolyte of Hayti has secured a loan from bankers in Port-au-Prince, and otherwise so strengthened his position that the proposed incursion by adherents of Legitime, whose headquarters were at Kingston, is said to have been abandoned.

Reports on the subject of irrigation made to the Secretary of Agriculture are much sought for, as they cover 12 States and Territories. It is claimed that two years ago, when the work was begun, the section of country west of the one hundredth meridian of longtitude was on the verge of being wholly abandoned for agricultural purposes. Since the fact of an underflow has become known fears caused by drought in these regions have largely disappeared.

Signs multiply that England is much annoyed by the commercial advantages gained by the United States in its recent treaties with Brazil. In the British Parliament on February 19 the Secretary for the Foreign Office, replying to a question on the subject, said that the Government was trying to obtain from Brazil similar commercial advantages to those enjoyed by the United States, but, he added, Brazil had not as yet shown any readiness to grant such concessions.

A London telegram says the contract has been signed for the building of the Mexican Northern Pacific Railroad, to run 1400 miles from Deming, N. M., across the Sierra Madre to the Gulf of California.

Russia has already made preparations for the Chicago exhibition such as assure a satisfactory display.

A fire in the shops attached to the Reformatory in Elmira, N. Y., destroyed the hardware department.

The discoveries of iron ore in the Mesaba range on Lake Superior are reported to be "the greatest finds for years."

Traffic managers of Western railroads represent that 70 per cent of the new wheat crop still remains in the granaries, assuring a heavy business by all routes to the seaboard until the next crops are ready to be moved.

The threatened monetary crisis in Australia is felt more severely. Ten of the local savings banks in New South Wales are reported to have stopped payment.

Latest mail advices bring the information that according to the census returns the population of the city of Rio de Janeiro is 515,559.

Despite dullness in the South, the coastwise steamship lines report that the freighting business is not appreciably lighter than it was a year ago.

It is more than suspected that the Russian Government is hoarding for the use of the army much of the grain gathered for the famine sufferers and that loans ostensibly for the same object were in great part reserved for the War and Marine Departments.

The Iron Age

New York, Thursday, February 25, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - HARDWARE EDITOR.
JOHN S. KING, - - - - BUSINESS MANAGER.

Cheap Prices Penetrate Every Section.

An interesting feature of the present condition of the iron trade is the widespread prevalence of low prices. No corner is too remote to be overlooked in the incessant drumming for business now going on. No consumer is too insignificant to be courted for such favors as he may have to dispense in the way of orders. Differences in freight are not maintained with any firmness. Competition for business may indeed cause freight rates to be very largely ignored. For instance, iron and steel products have recently been sold in Colorado at considerably less than the freight rate from Chicago or more Eastern points would permit. At not a very remote period the question of freight rates cut quite an important figure in fixing prices and it seemed to be necessary for every consuming center to make itself also a producing center, to the end that the local trade should be served at reasonable prices. The occasion for this no longer seems to exist, or at least not in such a marked degree. Manufacturers in the same town are now found competing so vigorously with one another for business 1000 miles away that they practically establish a flat price without regard to freight rates. This is proving especially true in the West, and it must be of enormous benefit, enabling improvements to be made which would hardly be undertaken if iron and steel products were as dear as distant works and high freights would naturally seem to make them. The fact is not overlooked that this condition of trade has been brought about by the expansion of productive capacity in excess of the immediate wants of the country, and the possibility that the country's requirements may grow just as suddenly as they have at times in the past. There would then be a partial restoration of geographical differences, it is true, but it would not long exist. The manifest destiny of American prices of manufactured products now seems to be toward another standard than that which has heretofore prevailed. We are progressing steadily toward a cheaper and cheaper basis. There may be occasional reactions, but the course seems to be plainly marked.

Surprise is expressed by some newspaper writers that an export movement of gold has begun, in spite of the fact that there is a heavy trade balance in our favor, as shown by the report of the Bureau of Statistics. One important fact is usually forgotten in connection with the figures presented by that department. The valuations of imported goods as entered in the statistics are those upon which the duties are assessed; in other words, the market price abroad, and not the c. i. f. price at American ports of entry. Our imports must therefore be swelled by the cost of freight, the profits of importers and additional expenses. On articles upon which a specific duty is paid the valuations are, of course, of relatively little importance, so far as the customs are concerned, however great their influence upon import statistics may be. As an illustration we may note that during the last fiscal year there were imported 955,517 tons of iron ore, valued at $2,430,159, or $2.53 per ton. It is quite clear to any one familiar with the trade that this valuation is far too low. A further unknown factor is the amount of money sent to foreign investors in the form of dividends and interest on securities held abroad, while the movement of stocks and bonds in speculative sales and purchases escapes all efforts at an estimate. Under the circumstances the balance of trade, as shown by the returns of the Bureau of Statistics, is a very unsafe guide. It can be relied upon only to indicate movements in a general way.

The Cast-Iron Pipe Trade.

The manufacturers of cast-iron pipe are just now passing through the vale of adversity. Excessive competition has reduced prices in this branch of trade until it is difficult to see how manufacturers are able to recoup themselves for the mere cost of the materials they use and the labor they employ. Within the past month a contract for 2500 tons has been placed at $22.47 per ton, delivered at Minneapolis. Another contract was taken by a Cincinnati establishment, covering 1300 tons, at $19.85, delivered in St. Louis. A Boston order for 3000 tons went to Radford, Va., at $25.40, delivered. An inquiry for a small quantity for Chicago promptly brought one of the officers of a very large concern to interview the intending purchaser, and the transaction was closed at $22, delivered. In the case of the Minneapolis contract, the pipe is hauled from an Ohio River foundry. The St. Louis contract was taken by Cincinnati, although one of the largest pipe foundries in the country is located in the Missouri metropolis. The Boston contract tested the competitive ability of the Eastern Pennsylvania pipe makers, having been taken by the Virginia makers at just $1000 less. In every case rigid inspection is a part of the conditions of the contract, and as good work will be insisted upon as if the pipe were bringing $40 a ton.

World's Fair construction in Chicago profits by these low figures. Nearly 80 miles of cast-iron pipe have already been laid in Jackson Park for various purposes in connection with the World's Fair enterprise, and the authorities are in the market for 2000 tons more, on which the successful bidder will very probably go even lower than any of the prices named above. The World's Fair of 1893 has been most fortunate in the era of low prices which has prevailed during the period of construction, enabling all kinds of work to be done at a cost considerably inside of the estimates made when the project first took definite shape. "It is an ill wind that blows nobody good."

Indiscriminate Immigration.

Not long ago an able-bodied emigrant safely landed on our shores was deemed worth $1000, cash. There was little or no hesitancy in welcoming any number of them. But a change of sentiment in regard to this matter is observable, and the average American voter would pause before accepting emigrants at the former estimate of valuation. There is now a decided disposition to inquire into nationality, circumstances and condition. America has become saturated with imbeciles, paupers and decrepid persons, the larger part of whom are of foreign origin. Our eleemosynary and penal institutions alike are overtaxed and constitute a burden on society. Moreover, the ranks of the laboring classes are crowded by those who accept low wages and willingly adopt a manner of subsistance degrading to all who are brought into competition with them.

So palpable are the injuries thus inflicted that a revulsion of feeling has been aroused, and bills introduced in our legislative bodies with the object of abating the evils complained of find strong supporters. The following tabulated statement serves to show how well grounded are the apprehensions indulged, by indicating not only the enormous aggregate of the annual accession to our population from foreign countries, but the changes which are taking place in its character:

Countries.	1891.	1890.
Austria	11,079	7,786
Hungary	27,548	24,994
Other Austria (except Poland).	32,084	30,315
Total	70,711	63,095
Denmark	10,466	9,953
France	6,527	6,684
Germany	123,401	96,482
Italy	68,481	62,492
Netherlands	5,364	4,414
Poland	31,285	19,737
Russia (except Poland)	73,177	40,888
Sweden and Norway	52,262	43,197
Switzerland	6,928	6,791
United Kingdom, England and Wales	52,350	55,859
Scotland	12,484	11,396
Ireland	55,888	53,312
Total	120,722	120,567
All other countries	21,342	16,731
Total	590,666	491,026

Emigration from the United Kingdom seems to have reached its climax, while Russia, Poland and other countries less congenial are sending over unwonted numbers, largely the victims of famine and disease.

The report of the commission appointed by Secretary Foster last spring, to investigate the subject of European emigration to the United States, confirms the common impression that the movement is primarily induced by a desire to participate in the advantages of superior conditions in this country, higher wages and less onerous service, but do not support to any extent the theory that "assisted emigra-

tion," either by governments or steamship companies, prevails to any extent in the countries visited. Nor are contract laborers imported to any extent. The remedy prescribed is to be had through the action of Congress in holding steamship companies responsible for the character of the emigrants they bring—paupers and criminals to be returned at their expense, under such regulations as may be prescribed. Consular inspection is declared to be impracticable. In a lecture delivered in Boston last week Gen. H. A. Walker argued that the regulation of immigration rests with workingmen, that they must take the initiative and insist on the imposition of a heavy tax, the exaction of $100 "head money," the same to be returned at the end of three years to every person remaining in the country, upon presentation of satisfactory evidence that he is at the time a respectable and self-supporting citizen. During the past week Commissioner Owen at Washington had several conferences with the Board of Immigration, as well as the customs officials at New York, and while he has not yet reached a conclusion on the subject, his idea is that not less than $1 per head should be paid by the steamship companies for steerage passengers emigrating from European and other ports, with a view to having a sufficient sum always on hand to care for such persons at least a year.

The indications are that among future subjects of legislation immigration will have a prominent place, and the agitation will continue until existing abuses are either wholly removed or mitigated to a very considerable degree. The country will be vindicated in any reasonable measures calculated to relieve itself from a continued invasion of pauperism and disease. Up to a recent date the country was capable of absorbing, without apparent detriment to any, all who choose to come hither. The fugitive from the Old World seeking to better his condition could settle on the frontiers, if not on the seaboard, could subdue the forest, occupy the prairies, delve in the mines, build railroads and canals, or in some other way assist in developing the resources of the country. But now labor is numerically strong and well organized. The former necessities for outside assistance do not exist. Having provided for 5,250,000 foreigners, the waste places are well taken up.

It is becoming more and more evident that the smaller iron and steel manufacturing concerns will have dangerous competitors in the large steel works. The policy is being pursued by the latter of getting as closely as possible to the actual consumer. Their purpose is to diversify their interests and control whatever profits there may be in intermediary lines of industry. They aim to retain their hold on certain staple products and at the same time work into specialties. The principal aid in this movement is the rapid change from iron to steel in many subsidiary industries. Smaller mills have not the capacity to utilize the output of an entire steel plant, particularly when Bessemer steel can be used. The works which at first supply them with billets conclude that they might with greater profit roll the marketable article, and put in the necessary plant, relying upon an elaborate selling force to economically market the product. In this manner large steel mills have gone into the building of bridges and elevated structures, they are branching out into the production of all classes of railroad material. Thus, lately in the East two steel works have entered into competition with the smaller special mills on track angle bars. Others have driven more and more into the merchant steel business. One has entered shipbuilding and another is said to be preparing to produce the complete equipment and rolling stock for electric railroads. The point may be reached at which enormous organizations of such a character become too unwieldy to be successfully managed even by great captains of industry.

OBITUARY.

BERNHARD LEHMAN,

one of the most prominent citizens of Bethlehem, Pa., died suddenly in that city the 17th inst. of hemorrhage of the lungs. Mr. Lehman was one of the town's most progressive citizens. He was one of the organizers of the Bethlehem Board of Trade and has always been an active member. Besides operating the Lehigh Valley Brass Works, he was superintendent of the Bethlehem South Gas and Water Company and also superintendent of the Stemton Car Works. He devised the plans for the enlargement of the town's big reservoirs. It was through his active work that the Stemton Car Works have reached a flourishing condition.

JOHN W. HOWARD.

John W. Howard, founder of the wire goods manufacturing business conducted by Howard & Morse, at 45 Fulton street, New York, died on February 10, at his residence, 795 Bushwick avenue, Brooklyn. An announcement relating to his death appeared in our last issue, but the confusion of names therein was unfortunately misleading. Mr. Howard died suddenly of an acute attack of pneumonia. Mr. Howard was born in England, January 12, 1826. He was a self-made man, having been apprenticed to a wire cloth manufacturer in England at the age of 9 to learn the business. Since that time he has followed this line, in which he was regarded as probably the most expert master mechanic in this country. Mr. Howard emigrated to America when about 20 years old and was employed several years as foreman in the wire-weaving establishment of the late Thomas Moore upon Beekman street. Here he remained until 1848, when he started in business for himself. His establishment at the corner of Fulton and Pearl streets was burned out on January 12, 1862. On May 1 of that year he formed a copartnership with David R. Morse under the firm name of Howard & Morse, and the business has since been conducted under that style. Mr. Howard was a man of a warm heart, quick and sympathetic by nature, of sterling qualities, with an uncompromising sense of honor and justice. Upright in the strictest sense, retiring and reserved to such an extent that his very manly qualities did not appear to the casual acquaintance, his rugged strength of character commanded the respect, esteem and confidence of all who knew him, and his loss is keenly felt by a large circle of social friends and business associates. A widow and four sons, Edward, Herbert, William and Frank Howard, survive him. The business will be continued by David R. Morse and his sons and the sons of the late Mr. Howard.

M. C. BIGNALL.

M. C. Bignall, president of the Bignall & Keeler Mfg. Company, St. Louis, Mo., died on the 5th inst., as the result of a stroke of apoplexy. Mr. Bignall came to St. Louis from Medina, N. Y., about 20 years ago, and had been in active business up to within two years of his death, at which time he received a stroke of apoplexy which left him unfit for duty. He leaves a wife and one son.

A Dispute Over Natural Gas.

On Friday, the 19th inst., an opinion was handed down by the courts in the suit of Shoenberger & Co. of Pittsburgh against the Equitable Natural Gas Company of that city for a preliminary injunction restraining the gas company from shutting off the supply of gas from the mills of the plaintiffs. The plaintiffs contend that members of a number of firms, including the Crescent Steel Company, Zug & Co., Limited; Brown & Co. and Mackintosh, Hemphill & Co., Limited, are on the Board of Directors of the gas company, and the attempt to shut off the plaintiffs' supply was in order to furnish these firms with more gas. The plaintiff company are stockholders in the gas company, and claim they are entitled to a share of whatever gas there may be. The defendants contend that under an agreement, if there was a shortage of gas, the signers of the agreement were to be given the preference in the order in which they signed the agreement. This, it was claimed, had been adhered to, and the plaintiffs had no right to complain. The opinion of the courts is as follows:

It is conceded that if there is a sufficient supply of gas to equitably furnish the complainants and those having prior contracts, the complainants would be entitled to the injunction prayed for. This question is in dispute. The plaintiffs allege that a part of the supply furnished to the other parties is for new furnaces and a new plant taken on since the contract of plaintiff, and not in any event to have preference over them. This is also in dispute. There are other questions in dispute which the court cannot satisfactorily decide on *ex parte* affidavits. The defendant company undertake to decide these questions against the plaintiffs. The directors of the defendant company are potentially the very parties to be benefited by the proposed action of the gas company, and thus obtain the gas to be shut off from plaintiffs, and at a price admittedly far below the present market value. Under these circumstances the plaintiffs are entitled to have the disputed question settled by an impartial master and by the court. All that can be done within 60 or 90 days if due diligence is exercised. In the meantime, under all the circumstances matters should remain in *statu quo*, and a preliminary injunction should issue therefore. Let a decree be drawn accordingly.

The firm of Phelps, Dodge & Co., Cliff street, New York, have made arrangements with the Apollo Iron and Steel Company, Pittsburgh, Pa, by which they are to handle the entire product of Apollo Best Roofing made by the latter concern. This Plate is a high grade of terne, and roofers throughout the country will be interested in testing its qualities. The price of the Apollo Best Roofing Plate is given among our quotations elsewhere.

How Many Railways Enter Chicago?

OTSEGO, Mich., February 3, 1892.

To the Editor of the Railway Age:

Will you please to inform me what is the number of railroads that come into Chicago? B. A. NEVINS.

This is one of the most frequent questions which we are called to answer and it is one to which the answer cannot be stereotyped and repeated unchanged from year to year. Since we first commenced replying to it the number of Chicago railways has about doubled and even yet new enterprises are pointing toward this, the greatest railway center in the world. Now that our railways will soon be called upon to provide transportation for visitors from all parts of the earth the question as to their number becomes of increasing interest, and we will therefore undertake to answer it now in a way that will assist the memory in retaining the facts. The following is an alphabetical list of the steam railway companies whose lines and trains enter Chicago:

RAILWAYS IN CHICAGO.

Atchison, Topeka and Santa Fé.
Baltimore and Ohio.
Chicago and Alton.
Chicago and Calumet Terminal.
Chicago and Eastern Illinois.
Chicago and Erie.
Chicago and Evanston (C., M. and St. P.).
Chicago and Grand Trunk.
Chicago and Northern Pacific.
Chicago and Northwestern, three lines.
Chicago Southwestern (Wisconsin Central).
Chicago and Western Indiana.
Chicago, Burlington and Quincy.
Chicago Central (Wisconsin Central).
Chicago, Milwaukee and St. Paul, two lines.
Chicago, Madison and Northern (Illinois Central).
Chicago, Rock Island and Pacific.
Chicago, St. Paul and Kansas City.
Cleveland, Cincinnati, Chicago and St. Louis.
Illinois Central.
Lake Shore and Michigan Southern.
Louisville, New Albany and Chicago.
Michigan Central.
New York, Chicago and St. Louis.
Pittsburgh, Cincinnati, Chicago and St. Louis.
Pittsburgh, Fort Wayne and Chicago.
Wabash.
Wisconsin Central.
Number of companies, 28.
Number of lines, 31.

The following diagram, in which these lines are indicated, will serve to give an idea of the tremendous importance of this city as a railway center:

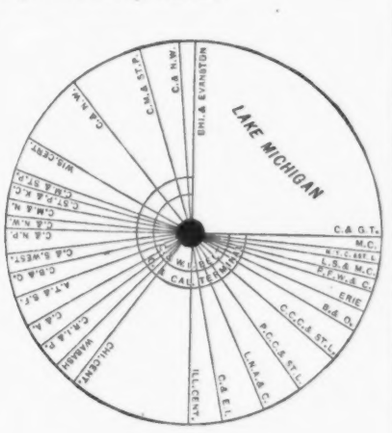


Diagram of Chicago Railways.

It will be understood that there is no pretence whatever to geographical accuracy in the arrangement of the lines in this diagram. All that has been aimed at beyond the mere enumeration is to show in a very rough way what may be called the general direction which the different lines take after leaving the city, while as two of the lines are belt roads connecting the different tracks the liberty has been taken of showing them as circles—though they vary greatly from a circular form in their long courses around the city. It will be seen that two of the companies have more than one distinct line leaving Chicago, so that while the number of companies is 28, the number of lines is 31.

The Mesaba Range.

The interest in the new iron developments on the West Mesaba range not only still continues, but is growing greater all the time. Outside of the mining men who have become financially interested in properties there, people from Duluth and from the outside are putting their money into stocks, and as a matter of course stocks are rising. The writer visited half a dozen of the best known of the properties in company with a party of 25 from this city, Minneapolis and Pittsburgh, on Wednesday of last week. The center of interest now is the group of partially developed mines lying about 60 miles north of Duluth and a dozen miles west of the Duluth and Iron Range road, at Mesaba Station. These are the Cincinnati, Biwabik, Hale, McKinley, Canton, Chicago and Kanawha properties, and, surprising as it may seem, there seems but little doubt that all of them, with the possible exception of the Chicago, which is excepted only because it has not yet been developed, can soon be put in the list of shipping mines, if they are given railroad connection.

This part at least of the Mesaba range contains a horizontal vein of ore, generally a soft red hematite, though some limonite has been struck on the McKinley, and on the Cincinnati and Biwabik streaks of hard ore are found. All assays show the ore low in phosphorus, on an average lower than in the Vermillion, making it a splendid Bessemer. It has been reported or said to have been so reported that the quality is even superior to that of the Minnesota and Chandler mines, but this is not so. The ore will run from 58 to 64 per cent. metallic iron. The geological formation, Professor Winchell says, is almost the same as that of the Gogebic range, with this difference: The Mesaba vein is a horizontal one, and what is the greenstone capping on the Gogebic forms the boundary of the ore deposits. The vein has been tilted up and spread out over what is a large area, as the explorations up to date have shown. This fact has enabled explorers to get at the location of the ore with comparative ease, and very little work after the location has been located has sufficed to show up very large quantities of the ore. This fact should be remembered in reading the reports of the ore claimed to be in sight at the different mines. Because it has not been understood, many practical engineers and mining men have regarded some of the reports sent out from here as absurd.

Up to date the most work has been done on the Biwabik. Seventeen pits have been sunk, nearly all of which are in ore, and in few of which the bottom of the vein has been reached. The deepest pit is now down 97 feet and is bottomed in 81 feet of ore. The average depth is about 50 feet, and how much deeper can only be determined after more work, and the area now covered by the pits is 1200 x 1500 feet. Development work on the Cincinnati on the east and the Canton on the west shows that the area covered is even greater than determined by the test pitting outlined above.

Adjoining the Biwabik and even a larger property is the Cincinnati. Not so much work has been done here, only 13 pits having been sunk so far, covering an area of 600 x 1200 feet, with the deepest 52 feet and the shallowest 22 feet in solid ore and all bottomed in it. It is estimated that the average depth of ore so far shown up is about 40 feet. Further development will probably show upon this property even a greater body of ore than there is on the Biwabik.

East of the Cincinnati come the Kanawha and the Hale. On the former three pits have been put down, all showing a good depth of ore, and of about the same quality as on the other locations. On the Hale nine pits have been put down, of which seven have fine showings of ore. One pit is 50 feet in solid ore, the ore beginning at the surface. On both the Hale and Kanawha the ore approaches very close to the surface at all points. West of the Biwabik lies the Canton, owned by the Minnesota Iron Company syndicate. This property has now in sight from four pits, according to the estimate of President Bacon of the Minnesota Company, 500,000 tons. Two miles southwest of the Canton comes the McKinley, where a large body of ore has been shown up by test pitting. In one pit ore was struck at a depth of 20 feet from the surface, and it is bottomed in 50 feet of ore, which has assayed from 2 to 3 per cent. higher grade than the ore in any other mine on the new range. Two other pits have also shown good bodies of ore. In one of them some of the ore is limonite, though there is not much of that.

Between the Canton and McKinley lies the property of the Chicago, comprising about 700 acres, and work was started there to day under the direction of Captain Florida, one of the best known mining captains of the Gogebic range. The ore body undoubtedly extends through this property. All these mines are in township 58–16. The McKinley is owned by the McKinley Brothers of Duluth, the Chicago and Cincinnati and Kanawha by stock companies, of which the controlling spirits are A. E. Humphreys, John McKinley, Judge J. T. Hale, E. C. Gridley, O. D. Kinney and George J. Atkins of Duluth, and G. E. Milligan of Parkersburg, W. Va., and the Biwabik by a company controlled by the Merritts and A. S. Chase of Duluth, and Donald Grant and K. D. Chase of Faribault, Minn. In town 58–17 are several valuable locations upon which ore has been shown up, but not so much has become known about them. The Ohio Company, the president of which is ex Governor Campbell, has three pits in ore on one location, and one pit in another. In town 58–18, the Mountain Iron Company have about 700 tons of ore in sight, while still further west work is being carried on. Messrs. Trimble and Hibbing have found some ore in 58–20.

It will be comparatively inexpensive to mine the ore on most of the locations described. Some of the more enthusiastic think it can be done for 50 cents a ton, and one company have even offered to contract to deliver it to furnaces located in Duluth at $2 a ton. It is probable that 75 cents a ton would be a safer estimate of the cost of mining.

The Duluth and Iron Range road have surveyed a branch line from a short distance below Mesaba Station to the Canton mine, passing over the Cincinnati property, and will probably have it built early in the summer. The Duluth, Mesaba and Northern, a new company, have let their contract for construction, and will be at the Mountain Iron, if not at the McKinley and Biwabik, by August 1.

About fifteen companies have been organized to work on the range, but so far stock has been offered in but seven, so that while there is a large speculative interest here, no wildcatting has yet been done. Fortunately for the range, the land is largely owned by large lumbermen, who are refusing to lease indiscriminately.

Another correspondent sends in the following: "In connection with the interest

awakened in the Mesaba iron range of Northern Minnesota a brief summary of the discoveries on that range, and its extent, geographically considered, may be of much value. Although the development of the Mesaba is a fact of but few months, the original discoveries there were made nearly 30 years ago. At that time the Mesaba Iron Company, consisting of men from Northern Michigan and at Duluth, became owners of tracts of land aggregating 9000 acres, on which there were some outcrops of hematite and limonite, the tracts lying chiefly in townships 60–12 and 60–13. These lands were explored some what, but as the ore bodies were chiefly covered by black slate or by gabbro little was found except at the outcroppings. The Duluth and Iron Range Railway was given a charter and a land grant to build to the properties, and in 1870 Professor Chester was sent out to examine them. Five years previous to this, however, George R. Stuntz, a Duluth land surveyor, had journeyed to Vermillion Lake, discovered the great outcroppings of specular ore of what is now the Minnesota Iron Company, and had brought back specimens. He induced Professor Chester to visit the Vermillion and in a few days three men with primitive tools opened a vein 13 feet wide. This was the first mining work done in Minnesota.

"After this nothing was done till 1880, when Mr. Stuntz surveyed town 62–15, and the location of the Minnesota Iron Company was made. Experts were sent up, and in 1884 the Duluth and Iron Range road shipped out the first ore, their line crossing the Mesaba range in the immediate vicinity of what are now known as very valuable mines. The Mesaba in the meantime lay dormant. In 1889 a corps of Duluth surveyors, headed by C. C. Merritt, by chance found the deposit of iron in township 58–18, where the Mountain Iron Mine now is. The Merritts at once began explorations, and continued them quietly for a year or more before the public knew what they were doing. In the summer of 1889 iron finds were made on the banks of the Mississippi River, about 75 miles west of the Merritt discovery, and before long outcrops of the Huronian formation were found between these limits. In the summer of 1891 an explorer for J. T. Hale of Duluth found in the earth turned up by the torn roots of a wind-blown tree in town 56–18, 12 miles east of the Mountain Iron find, unmistakable signs of rich soft-ore bodies. Development soon showed, lying along an outcropping ledge of green schist for 5 or 6 miles from this fallen tree, what is now characterized by the State Geologist as 'deposits of ore which for area or territory covered, ease and economy of mining and freedom from impurities have rarely, if ever, been equaled.'

"For two or three years past development operations have been carried on about 15 miles west of this last mentioned find, at the very crossing of the Iron Range road. Here half a dozen excellent properties have been opened, and but for the fabulous finds elsewhere and unfriendly railway matters would already be shipping high grade ore. For a year at least the old properties of the original Mesaba Iron Company have been under an option of sale to the Mesaba syndicate, a Duluth corporation, for $600,000. The syndicate has so far spent about $35,000 in diamond drill, test pitting and other explanatory work. In township 60–12, and near by, it has over 60 pits well bottomed in ore, some magnetite, some soft hematite and some limonite. Still east of these discoveries, and way on to Lake Superior, outcrops of more or less apparent value have been found by explorers. There is one outcrop toward the east that is 12 miles in length.

"Between all these isolated workings the ore body has been traced in a generally easterly line, bearing slightly northerly, from the head of navigation on the Mississippi 175 miles, across Itasca, St. Louis and Lake counties. The vein bodies lie nearly flat, dipping 10° to 20° toward the south, and are not confined in a narrow limit. South of the general greenstone boundary are islands of schist about which ore is to be found, so that the extent of the Mesaba range is but guessed at as yet. That its supplies of ore can be drawn on for centuries there is no question."

The Substantial Basis for Better Business.

The following statement originates from a Western source:

Careful investigations made by traffic managers of the Western roads show that since last fall's crop began to move to the Eastern and foreign markets about 30 per cent. of it has now left the farms and elevators of the West and been carried to its destination. The moving of this 30 per cent. has kept the roads interested in the traffic as busy as they could be for five months and the Eastern roads have been in a state of blockade for the greater part of the time. The blockade has been recently raised, it is true, but still a number of the roads claim that they can hardly be said to have resumed active relations with their Eastern connections, because if they forced all the grain on them that they could get hold of the blockade would be renewed worse than ever. Eastern roads have considerably more cars at their command now than when this traffic began, and it is probable that they will be able to keep things moving until the opening of navigation, when a sufficient outlet will be afforded for all that can be sent forward during the remainder of the year. With 70 per cent. of last year's crop still in the West the traffic managers say that there will be no possibility of light business either by all rail or railroad lake lines until next year's crops are ready to be moved.

If this be true there is no room for doubt as to the future. Such a season of prosperity is yet in store for the railroads of the greatest part of the country as must have a beneficial effect on all kinds of business. Even if it is but half true, the condition of the railroads would still be far better than that of last year or the year before. As "it is always darkest before day," it is just possible that the business men who are looking for "worse to come" may be greatly deceiving themselves and those who trust in them. Every previous period of depression has in time given way to an improved condition of trade, and so will this one.

The Galvanized Sheet Makers.

By Telegraph.

The National Association of Galvanized Sheet Iron Manufacturers met at the Hotel Duquesne, Pittsburgh, yesterday, N. E. Whitaker of Wheeling, president, and Henry Whitley of Philadelphia was secretary. The meeting was fairly well attended, but no change was made in prices. The following were confirmed as the additional prices on extra sizes: Extra widths on Nos. 16, 17 and 18, over 36 to 40 inches, inclusive, 1 cent per pound; over 40 to 44 inches, inclusive, 1½ cents per pound; over 44 to 48 inches, inclusive, 2½ cents per pound; on No. 19 and lighter, less than 24 inches wide, 1 cent per pound; over 32 to 36 inches, inclusive, 1 cent per pound; over 36 to 40 inches, inclusive, 2 cents per pound; over 40 to 44 inches, inclusive, 3 cents per pound; over 44 to 48 inches, inclusive, 3 cents per pound; extra length longer than 120, 1 cent per pound. No other action was taken. These prices on extra sizes go into effect at once.

Washington News.

(*From Our Regular Correspondent.*)

WASHINGTON, D. C., February 23, 1892.

In referring to the armor tests at Indian Head it was stated at the Ordnance Bureau of the Navy Department to-day that the third firing in the series will not be taken as part of the scientific results which these tests were desired to accomplish, as the first two demonstrated conclusively the superiority of nickel steel over any other forms of steel for armor purposes. The third firings were had simply to complete the series.

The data of the firings of the first and second days is very complete and will be the basis of more elaborate treatment than contained in the report already issued.

The Secretary of the Navy, Commodore Folger and the ordnance experts generally express the opinion that American armor is now in advance of the armor-making processes of any of the great nations of the world. There has been much comment and discussion in foreign publications on the subject, all of which concedes our superiority.

It is evident from the talk in naval circles that the impression prevails that the settlement of the Chilian affair will only last until some other opportunity may present itself to embark in a contest with the United States. According to the advices from England and France the Chilian Government is not abating its efforts to strengthen itself in naval material, in ships and guns.

It was remarked in this connection that whatever additions of strength Chili might make by purchase the United States will more than equal in the completion of ships now under way. These vessels will be the most formidable of their class, and will not be surpassed in offensive or defensive qualities by any vessels in foreign navies.

The armored battleship and cruiser Maine and Texas will be the most formidable craft afloat. It is expected that both will be completed next year.

These will be followed by authority to build additional ships of equal if not superior fighting power.

The Joint Congressional Committee which visited the Bethlehem plant are very well satisfied with the condition of things at that great establishment.

They will bring to the attention of Congress the admirable facilities which the Government now has at command for the highest class of work in the latest materials for shipbuilding, armor and ordnance.

The use of nickel in steel for naval purposes, it is hinted, has solved the problem of rolled or forged steel in point of superiority. It is now claimed that there is no difference in the merits of nickel steel worked by either method.

The Census Bulletin giving the statistics of manufactures in 1890 in the District of Columbia shows that the Federal Territory has made exceptional progress in other branches of industry than law making. The percentage of increase in establishments during the decade was 107.53, or, 1880, 970; 1890, 2013. The capital invested increased from $5,527,526 in 1880 to $22,805,961 in 1890. The greatest increase has been in the building trades. The manufactures are almost exclusively to meet the large demands.

MANUFACTURING.

Iron and Steel.

The plant of the Keystone Rolling Mill Company, Limited, at Pittsburgh, which has been closed down for about a month, was put in operation on Monday, 22d inst.

The Wheeling Corrugating Company of Wheeling, W. Va., have just put in operation a new 72-inch tubular steel boiler, with 64-inch flues. The boiler was built by A. J. Sweeney & Sons, also of Wheeling, and is expected to develop 150-horse power.

Carnegie, Phipps & Co., Limited, of Pittsburgh have decided to displace the present plate mill at their Lower Union Mills in that city with a new 26-inch three-high plate mill, having pivoted lifting driven tables. The length of the roll is 26 inches. The upward and downward motion of the upper and middle rolls is similar to that on their large plate mill at the Homestead Steel Works, at Homestead, Pa.

Wm. Swindell & Brothers, engineers and contractors, Pittsburgh, Pa., have received a contract from the Apollo Iron and Steel Company, at Apollo, Pa., for the erection of a fuel gas plant. This plant is to consist of eight Swindell producers. They have also received from the above firm a contract for changing the open-hearth heating furnaces for the use of manufactured gas. From Park, Brother & Co., Limited, proprietors of the Black Diamond Steel Works of Pittsburgh, they have received an order for the erection of a 30-ton open-hearth furnace; and from the Sterling Steel Company of Demmler, Pa., an order for the erection of two of their heating furnaces. In addition to the above they have received a contract from Wm. Clark's Son & Co., Solar Iron Works, at Pittsburgh, for the changing of the open-hearth furnaces for the use of manufactured gas.

No. 2 furnace of Andrews & Hitchcock, at Youngstown, Ohio, was blown out in January, 1891, after a blast of about five years. The firm are now remodeling and repairing the stack, in order to have it ready to blow in when a favorable time comes. The firm advise us that "As things look now that time is a good ways off."

The Columbia Iron and Steel Company of Pittsburgh, whose plant is located at Uniontown, Pa., have made a demand for a reduction of 25 per cent. in the wages of their employees. As this plant is under control of the Amalgamated Association, the concern having signed the scale, the employees, of course, refuse to accept the reduction, and unless a settlement is reached it is likely a strike will occur. The Columbia Iron and Steel Company are manufacturers of structural shapes, and the recent dissolution of the beam pool, with the consequent drop in prices, has left the concern in a position in which they are unable to compete with prices now ruling. This is given as the reason for the firm requesting their employees to accept a large reduction in wages.

The Sterling Steel Company of Pittsburgh, whose plant is located at Demmler, Pa., a few miles from that city, are about to let a contract for the enlargement of their works. They propose to add a department for the manufacture of steel projectiles for the United States Government. The improvements embrace two new mills, each 70 x 160 feet. Only the highest grades of steel are made by this concern, and in recent tests made by the Government their product made an excellent showing.

At a meeting of the stockholders of the Youngstown Steel Company, held at Youngstown, Ohio, last week, the following directors were elected: Tod Ford, Paul Jones, E. L. Ford, Henry Tod and George Tod. The directors organized by electing Tod Ford president, Paul Jones vice-president, John Stambangh, Jr., secretary and treasurer and E. L. Ford general superintendent.

The severe depression now existing in the iron trade will probably result in the closing down for an indefinite period of some of the blast furnaces in the Mahoning and Shenango valleys. It is stated that already several concerns are making preparations to close down their plants for an indefinite period, and that operations will not be resumed until there has been a decided improvement, both as regards prices and demand.

The muck-bar mill recently erected by the Wilkes Rolling Mill Company, at Sharon, Pa., has been put in operation. Only muck bar will be manufactured, and the product will be disposed of to the mills making finished iron located in Sharon and New Castle, Pa.

O. P. Mason, Bellaire, Ohio, inventor of the Mason ingot manipulator, has closed a contract with the Pottsville Iron and Steel Company, Pottsville, Pa., for the erection in that plant of a Mason ingot manipulator. The Mason ingot manipulators are now in use in a number of the largest steel plants in the country and are giving entire satisfaction. Several have recently been put in the Homestead Steel Works of Carnegie, Phipps & Co., Limited, at Homestead, Pa.

The Denver Steel Rolling Mill Company have been incorporated at Denver, Col., for the manufacture of barbed wire, nails, wire rods, cotton ties, &c. The capital stock is $250,000.

St. Louis parties have been making investigations in Birmingham, Ala., with a view to establishing a cotton tie factory at that place.

It is expected to have the new Gracey-Woodward blast furnace, at Clarksville, Tenn., ready to start by April 1. The stack will be 70 x 17 feet.

The new Napier charcoal blast furnace, at Napier, Tenn., has been blown in. The stack is 60 x 12 feet, and the product will be car-wheel pig iron.

The Chicago Steel Casting Company, recently organized at Chicago, Ill., have awarded a contract for their open-hearth steel plant to D. R. Lean, engineer and contractor, Pittsburgh, Pa.

The Totten & Hogg Iron and Steel Foundry Company of Pittsburgh, Pa., have closed a contract with the Midland Steel Company of Muncie, Ind., for a large 24-inch universal and blooming mill combined, with 100 feet of roller tables. This mill is for a new plant which the Midland Steel Company are now erecting at Muncie, Ind. The Totten & Hogg Iron and Steel Foundry Company are sole manufacturers of the Higgs Turtle Water Valve, for gas furnaces and producers. This valve is used in connection with the gas producers for reversing the gas from one end of the furnace to the other, the object being to secure at all times an accurate and positive seat.

It is stated that William S. Raynor, president of the Curtis Bay Harbor and Improvement Company of Baltimore, has purchased the plant of the Paterson Iron Company of Paterson, N. J., which will be transferred to and operated at Curtis Bay within the next three months. The works will be conducted under the title of the Baltimore Rolling Mill Company, and will give special attention to the manufacture of steel plates.

The steel plant of the Syracuse Steel Foundry Company, at Syracuse, N. Y., which was totally destroyed by fire on January 7, is being rebuilt. The open-hearth plant will contain two 10-ton furnaces, as before. The company will not rebuild their crucible steel plant, but will manufacture open-hearth steel castings entirely.

F. Lynwood Garrison and Frank C. Roberts of Philadelphia have closed an agreement with the N. & G. Taylor Company for the engineering work on their new tin-plate plant in Philadelphia.

Cofrode & Saylor of the Reading Rolling Mill, at Reading, Pa., on Thursday night notified their employees of a 10 per cent. reduction of wages, to take effect next week. The firm employ about 630 hands.

Receiver T. H. Aldrich has petitioned the United States Court asking that the Gadsden-Alabama Furnace at Gadsden be sold. The petition has not yet been acted upon.

The Watts Furnace at Middlesborough, Ky., will go into blast about July 1. The furnaces are completed and would have been in operation some time ago but for the lack of water, there having been some trouble between the American Association and the Watts Bros. concerning the water supply. This has now been settled.

The Rome Cotton Tie Company, Rome, Ga., have found it necessary on account of their increasing business to increase their capacity, and will add new machinery and put in additional puddling furnaces.

The Bessemer Steel Works, Troy, N. Y., will probably soon shut down for a short time that necessary repairs may be made. The shut down will not be for longer than two or three weeks.

The Lukens Iron and Steel Company of Coatesville, Pa., have just completed their open-hearth steel plant, and commenced operations on Thursday, the 16th.

The strike of the molders of the Monitor Iron Works, Sing Sing, N. Y., which was inaugurated early in January, is still on.

Alex Laughlin & Co., engineers and contractors, Lewis Block, Pittsburgh, Pa., have recently closed a contract with the Reading Iron Company, Reading, Pa., for the erection of a tube-welding furnace, gas producers and flue, covering complete equipment for their new butt-weld mill. This is the fourth tube mill that Alex Laughlin & Co. have received orders from within a year, the firm having been very successful in the construction of plants for this class of works.

Wm. Tod & Co., engineers, founders and machinists, of Youngstown, Ohio, have closed a contract with the Pennsylvania Steel Company, Sparrow's Point, Md., for two pairs of engines with a capacity of 4000 horse-power, to drive the new universal mill of that firm. One pair of these engines will be larger than any heretofore built, having cylinder 42 inches in diameter and 60 inches stroke. The driving gear of this pair of engines will be of steel 5 and 10 feet in diameter, with 36-inch face and 19-inch pitch. The same firm are in receipt of an order from Carnegie, Phipps & Co., Limited, of Pittsburgh, for running out tables, to be placed in the new structural mill which that firm are erecting at their Homestead Steel Works at Homestead, Pa. Wm. Tod & Co. report that the demand for Porter-Hamilton engines is larger than at any time in the history of the firm, and that their plant is being operated to its utmost capacity in order to keep pace with the demand for this type of engines. The addition to their plant, which was commenced some time ago, is approaching completion, but considerable delay has been caused by some of the firms with whom orders were placed for the machinery being very slow in delivering same.

Early last week the Jefferson Iron Works of Steubenville, Ohio, notified their nailers of a reduction in wages amounting to 25 per cent. The men held several meetings, and after fully discussing the proposed reduction decided not to accept the same. Upon this action being reported to the firm, the demand for the reduction was withdrawn.

The United States Iron and Tin-Plate Mfg. Company, Demmler, Pa., have just started up one new tin mill, which will be known as mill No. 5. The concern have their new building under roof, and expect to start the new engine, which is already on the grounds, within the next 60 days, and as soon as this is done mills 6, 7 and 8 will be put in operation.

Number 3 furnace of the Pennsylvania Steel Company of Steelton, Pa., is out of blast, being relined and repaired. The other stacks of the firm are in successful operation.

The Findlay Rolling Mill Company of Findlay, Ohio, have increased their capital stock from $100,000 to $150,000.

Machinery.

The King Rock Drill Company of Pittsburgh have received an order from the Lehigh Coal and Hardware Company of Lehighton, Pa., for one of their Rock Drills, which will be shipped in a few days. The King Rock Drill Company state that inquiries for their drills are being received from all parts of the country, and the prospects for the future are very bright.

It is stated that the Westinghouse Air Brake Company of Pittsburgh, with shops at Wilmerding, Pa., have received a large order for air brakes from the Chicago, Burlington and Quincy Railroad as a result of the tests of the different types of air brakes recently made at Burlington, Iowa.

The Trethewey Mfg. Company of Pittsburgh are building a 124-inch shear with engine attached. The shear is fitted with solid steel knives, with four cutting edges, and will cut a ⅝-inch plate, and when completed will weigh 38,000 pounds. The same firm are building for the Pennsylvania Lead Company of Pittsburgh a mill for cold rolling silver plate, which will be fitted with hardened forged steel rolls 9 inches in diameter, and with a 16-inch face.

The Hygeia Hotel, Old Point Comfort, is just installing a 60 horse-power engine, this being the third furnished this hotel by the Ball Engine Company of Erie, Pa. The Ball Company have also recently installed the following: 150 horse-power for the Kittanning (Pa.) Electric Light, Heat and Power Company; 100 horse-power for the Lockport (N. Y.) Gas Company; 150 horse-power for the Westminster and Vancouver (B. C.) Tramway Company; 35 horse-power for the Commonwealth (Wis.) Iron Company. They have also lately provided engines for several office buildings in Pittsburgh.

The Unadilla Machine Shops, Unadilla, N. Y., have been leased by W. B. Warfield of Binghamton, N. Y. He has also leased the foundry in connection with them.

The Richards Grate Bar Company is the name of a new concern recently organized at Catasauqua, Pa., to manufacture a grate bar invented by Philip Richards of that place. The grate is applicable to any size boilers, and wherever applied is said to have been found very economical and satisfactory. Unlike most grate bars, it does not revolve or dump,

but is made of a series of parallel grates, moving horizontally, each one moving in a direction opposite to its neighbor. The effect is to grind the clinkers fine and to sift the ash and clinker through evenly, so as to cause the fire to settle down perfectly even upon the grate bars. The officers of the Richards Grate Bar Company are E. L. Bullock, J. A. Williams and Oliver Williams.

The steel derrick built by the Mahoning Foundry and Machine Company of Danville, Pa., for use in one of the quarries in Barre, Vt., has proved to be a success and moves loads up to 40 tons with a very slight expenditure of power.

The machine shops of the Ohio Valley division of the Newport News and Mississippi Railway Company will be removed from De-Kovan to Henderson, Ky.

Henry Wilson is preparing to erect a foundry and machine shop at Richland, Ga.

J. H. Cole & Co. of Parkersburg, W. Va., will establish a foundry and machine shop at Bridgeport, Ala.

Hill, Clarke & Co., 156 Oliver street, Boston, have bought the business of A. J. Kirkwood & Co., 12 South Canal Street, Chicago, Ill. They will take their stock of machinery and good will in the business and have hired the building which they now occupy. On April 1 C. A. Clark will go to Chicago to take charge of that branch of the business.

The Springfield Iron Works of Springfield, Mass., have secured a $20,000 contract for furnishing the iron and steel for the new State Library Building at Concord, N. H.

E. M. Lewis, proprietor of the Midway Machine Works and the Oxanna Nail Factory of Oxanna, Ala., has made an assignment. The liabilities are placed at $12,000 and the assets at $40,000.

The Tremont Engine and Boiler Works of Schuylkill County, Pa., have been chartered, with a capital stock of $100,000.

The Santa Fé Railroad Company have prepared plans for a machine shop 350 x 80 feet, to be erected at Kansas City, Mo., in the near future.

The Rogers Foundry Company of Belleville, Mo., will erect a $10,000 addition to their plant.

The American Fire Engine Company of Seneca Falls, N. Y., have purchased the entire properties, including real estate, machinery, tools, patterns, patents and good will, of the plants of the Silsby Mfg. Company of Seneca Falls, N. Y.; the Ahrens Mfg. Company of Cincinnati, Ohio; the Clapp & Jones Mfg. Company of Hudson, N. Y., and the Button Fire Engine Company of Waterford, N. Y. The former owners of these factories are all identified with the present company, and will be their active managers in the manufacture of fire engines and other fire apparatus. The company will continue the manufacture of the celebrated Silsby, Ahrens, Clapp & Jones and Button steam fire engines, as well as aerial hook and ladder trucks, hose carriages and carts, hand fire engines, heaters, stationary pumps and fire department supplies.

Hardware.

Empire Portable Forge Company, Lansingburg, N. Y., report business for 1892 opening up rapidly and earlier than last year, and expect a much larger volume of trade than for several years past.

Gibbs Mfg. Company, Canton, Ohio, advise us that the orders on hand for their lawn rakes and post-hole diggers are much ahead of last season, and every indication points to a largely increased trade on these goods.

Joseph Lay & Co., Ridgeville, Ind., advise us that the demand for their goods was never better and that the prospects for a prosperous spring trade are very encouraging.

Neverslip Horseshoe Company, Boston, report a gratifying demand for their goods, and intimate that if the country had been favored with an old-fashioned winter orders would have exceeded their capacity.

Diether & Barrows, Fort Wayne, Ind., advise us that the reception accorded by the trade during the past year to their Weisell washer has been very gratifying and refer confidently to the outlook for business during 1892.

F. V. Wooster, 66 Beverly street, Boston, advises us that his business during the past two months shows a decided improvement over the preceding ones. He looks for a still further increase as spring advances.

The manufactures of the Buhl Stamping Company, Detroit, Mich., are referred to in a recent issue of the Detroit *Tribune*, in which it is stated that their milk can stock, bird cages and tubular lanterns are meeting an extensive sale throughout the United States, and that considerable foreign trade has been developed. The plates used in the manufacture of the can stock are all tinned and retinned on the premises of the company, about 25 persons being employed in the tin-plating department. In addition to the staple lines mentioned above special tools, stamping dies and machines are made to order, as well as special articles of sheet steel, zinc, brass, copper and aluminum. About 130 persons are given employment in the works.

Udell Wooden Ware Works, A. A. Barnes, proprietor, North Indianapolis, Ind., have recently completed a new three-story brick addition to the old factory 90 x 70 feet, and will shortly tear down the latter, erecting in its stead a new brick structure two stories high, 272 x 72 feet, which, when completed, will give them factory buildings whose total measurement will be 362 x 72 feet. A new warehouse, also brick, will be erected, measuring 150 x 70 feet, two stories high. A battery of three new boilers and a 225 horse-power Lane & Bodley Corliss engine has been put in. The factory buildings will be heated throughout by the Huyett & Smith system, while electric light will be supplied by the company's own dynamo of 360 candle-power. An improved form of steam dry kiln, brick, will also be put up, the company's design being to replace all of the original frame structures with brick as rapidly as business will permit. When all are completed they will have twice the former productive capacity.

The Chillicothe Mfg. Company, Chillicothe, Ohio, have been incorporated, with a paid-up capital stock of $25,000, for the purpose of manufacturing coffee mills, rat traps, door holders and other household specialties.

The Huron Grindstone Company, Port Austin, Mich, advise us that they have fully developed the Lake Huron quarries at Grindstone City, Mich., opened up by them a year ago, and express confidence that the rock is equal to any ever placed on the market from the Lake Huron quarries. Their quarries are a part of the deposits of sandstone from which all of the Lake Huron grindstons and scythe stones are taken, and they state that during the past season they have supplied some of the largest hardware jobbers in the country with loose and mounted grindstones and scythe stones which have given satisfaction. They have also supplied some of the cutlery manufacturers with Lake Huron grindstones for cutlery grinding and understand that the goods have rendered excellent service. The rock produced from these quarries is referred to as particularly suitable for the use of cutlery makers, the grit being sharp and fast cutting and containing few pebbles and hard spots. The company advise us that they have on hand a large stock of Lake Huron grindstones, mounted grindstones and scythe stones, which they are offering to the trade at prices below those made by the combination. They are making preparations to do a large business during the coming season.

The Burgess Gun Company have been organized, with a capital of $500,000. The company's plant is building at Buffalo, N. Y., where they will manufacture the new repeating and automatic guns invented by Andrew Burgess. The company have secured the services of Fred. M. Bailey, formerly superintendent of the Marlin Fire Arms Company of New Haven, Conn., who will act in a similar capacity in the new concern. M. W. Barse is president of the company. There are five directors at present, namely, M. W. Barse, Andrew Burgess, Alexander R. Harper, R. C. Alexander and O. L. Snyder.

Miscellaneous.

The Pittsburgh Car Wheel Company of Pittsburgh have made application for a charter of incorporation. The incorporators are C. L. Magee, Jas. D. Callery, P. H. Griffin, Geo. L. McFarland and Robert J. Mercur. We understand the site has not as yet been selected on which the new concern will erect their car wheel factory.

At Troy, N. Y., February 10, the three-story brick factory in the rear of Nos. 411, 413 and 415 River street was badly damaged by fire. It was entirely occupied by Frederick S. Maltby as a wire works factory, and contained some valuable and complicated machinery. The damage reached about $4000, and was mostly by water. The fire is supposed to have been incendiary.

The reported sale of the Baxter Stove Works at Birmingham, Ala., to Chas. B. Bagby of Louisville is off The transfer was complete with the exception of signing some papers when a hitch occurred and the trade was declared off. The present owners will continue to operate the works.

The Western Mineral Wool Company of Cleveland, Ohio, have closed contracts in Chicago for 705,000 pounds of mineral wool, including 120,000 pounds for the Mecca flats, 225,000 pounds for the Groveland apartment building, and 360,000 pounds for the Produce Cold Storage Exchange.

CONTENTS.

TRADE REPORT.

The figures of the official report of the Steel Rail Association, in our Chicago report, are of universal interest because they clearly prove that early in the year the Rail makers who gave out the reports of sales did it with the object of "booming" the market. It was then stated that the Rail makers entered the year with 600,000 tons of orders and "options" on their books. The "options" have evidently not been taken to any startling extent, although it must be remembered that it is probably too early. While it is true that orders of 532,000 tons is a very great improvement over last year, when the quantity was nearly 200,000 less than that, it is also worthy of note that 1891 was an exceptional year, and that the quantity now booked does not represent more than a fair average. We pointed out repeatedly during the last fall that the developments in the Rail trade would furnish the key to the situation. There has been disappointment thus far, although there is still some possibility of a heavy businesss. It is interesting to note that the Cleveland Rolling Mill Company, who ceased making rails many years since and have been out of consideration as a producer, are getting ready to resume this branch of manufacture. It is reported that orders have already been secured.

From all the leading markets come complaints of declining prices in Pig Iron, and sacrifice sales are cropping up in every direction. They are widely attributed to financial weakness, and for that reason cause additional alarm. There is but one opinion on the necessity of cutting down production, but no pronounced voluntary movement in that direction is yet observable. Bessemer is weak in Pittsburgh at nominally $15.

The resumption of grain shipments has again lowered foreign Ore freights to 7/6. The cheapness of some of the foreign Bessemer Ores has led to their purchase by makers of common Forge and Foundry grades. Porman is available at 7¢ and Tafna at 7¼¢ per unit. The effect of heavy grain shipments is to increase lake freights of Superior Ore, and decrease ocean freights, so that it gives importers chances to meet Lake Ore in the Schuylkill and Lehigh valleys.

Extraordinary stories come from the Pittsburgh district concerning prices at which Steel Billets are offered. Buyers claim that they have been offered stock at less than $23. Sales close to $23.25 are admitted by sellers.

In Structural Material Chicago reports sales of Beams aggregating about 2000 tons at 2.25¢, delivered. In the East the business hangs fire because New York architectural works have old contracts on foreign Beams, which are said to aggregate about 7000 tons. Plates are very weak, notably in Eastern Pennsylvania, one of whose mills has captured a Duluth order for 1000 tons of Ship Plates at 2¢, delivered. Seacoast shipbuilders' orders continue to hang fire. In Track Material, Merchant Steel and other lines the markets are reported to be demoralized. Prices in the majority of cases are lower than ever before. Some of the Western car works have taken some round orders for cars.

The Copper trade is agitated and mystified by reports of sales to consumers on the part of the Calumet and Hecla Company at 10½¢. Lead has stiffened, in spite of the reported opposition of the Lead Trust, which last year consumed 85,000 tons of that metal. The Cœur d'Alene miners have been on a strike since the beginning of the year. The Camp is the greatest Lead producer in the country. A leading authority estimates the Lead contents of the concentrates shipped from the district, when running full, at 196 tons. The smelters are still running on old stocks, and it may not be until four or six weeks that the effect of so large a cutting out of the Ore supply is reached, through the enforced closing down of furnaces.

Chicago.

(By Telegraph.)

Office of *The Iron Age*, 50 Dearborn street, CHICAGO, February 24, 1892.

The situation has not improved in any respect. The market is in far from satisfactory condition, and there is little prospect of an early change for the better. Prices are now so low that consumers themselves are getting nervous. They are asking whether bottom will ever be reached, and are hoping for an advance in raw material to help them get better prices for their own products.

Pig Iron.— Local Coke Iron retains command of the field. Some makers have reached a point below which they will not go, but others are still seeking business and making inducements. No. 2 Foundry continues to be the weakest grade and $14 was shaded on a 2000-ton contract the past week. The usual run of orders now is from carloads to 50 tons, and on these our quotations fairly represent the market. Southern Soft Iron is in fair demand, but new furnaces are competing vigorously for trade and have in some cases made a cut of 50¢ for prompt cash to secure contracts for early delivery. The prices going now seem to have broken down the usual distinction between grades. The makers offering high grades at low prices are simply moving accumulated stocks, and are not willing to sell lower grades for future delivery at corresponding rates. Lake Superior Charcoal Iron is quiet, with an occasional sale of 100 to 200 tons at bottom figures. Rumors of shading are more frequent. The opinion is almost universal that a wholesale curtailment of production should be made in this branch to prevent a return to the demoralization of last fall. Quotations are unchanged, as follows:

Lake Superior Charcoal	$17.00 @ $17.50
Local Coke Foundry, No. 1	15.00 @ 16.00
Local Coke Foundry, No. 2	14.25 @ 14.75
Local Coke Foundry, No. 3	14.00 @ 14.50
Local Scotch	16.00 @ 16.50
Ohio Strong Softeners	17.75 @ 18.25
Southern Coke, No. 1	15.75 @ 16.00
Southern Coke, No. 2	14.75 @ 15.00
Southern Coke, No. 3	14.00 @ 14.25
Southern, No. 1, Soft	14.75 @ 15.00
Southern, No. 2, Soft	14.00 @ 14.25
Southern Gray Forge	13.75 @ 14 00
Southern Mottled	13.25 @ 13.50
Tennessee Charcoal, No 1	17.50 @ 18.00
Alabama Car Wheel	21.00 @ 23.00
Coke Bessemer	16.50 @ 17.00
Hocking Valley, No. 1	17.25 @ 18.50
Jackson County Silvery	17.50 @ 18.00

Spiegeleisen—Is firm at $28 for 20 %, but the demand is only for small lots.

Bar Iron.—Trade is reported by mill agents to be confined almost entirely to carloads. Enough of these are coming in to keep the best mills fairly busy in connection with their season contracts. The small mills, however, are hungry for work, and cause trouble when they compete. They are not taking enough orders to establish a lower range of prices gonerally, but form a good club in the hands of some buyers to secure concessions from larger concerns. Quotations range from 1 65¢ to 1.70¢, Chicago, half extras. Iron-finished Bessemer Bars are selling at 1.75¢ @ 1.85¢, with a steadily growing trade.

Structural Shapes.—At least one important contract for Beams was taken the past week. Other sales will bring the total business up to about 2000 tons. It is claimed by some members of the trade that very large orders have been quietly placed, but this is denied by others who are in a position to be well informed. The prices on standard sizes have ranged from 2.25¢ to 2 40¢, Chicago. Small Beams are bringing 2.57½¢, and 20-inch Beams 2.60¢ @ 2.75¢. Prices from stock run from 2.50¢ to 3¢. Mill lots of Angles are quoted at 1.95¢ @ 2.10¢; Tees at 2.25¢ @ 2 50¢; Bridge Plates at 2.05¢ @ 2.10¢, all Chicago delivery.

Plates.—The local demand is still drooping, except that orders from stock are growing more numerous, on which quotations are unchanged. The attitude of the mills is shown by an order for Ship Plates taken last week at 2¢ for 1000 tons, delivered, Detroit, under severe specifications by an Eastern Pennsylvania mill. Tank Steel, from mill, is quoted 2¢ @ 2.10¢, Chicago.

Sheets.—No. 27 Common Black Iron is selling at 2.85¢ @ 2.90¢, Chicago, from mill, and same gauge Steel Sheets 3¢, with but a limited demand for ordinary stock. Galvanized is quiet at 70 % off for Juniata from mill. Jobbers quote 3.10¢ for No. 27 Iron, and 67½ % off for Juniata Galvanized.

Merchant Steel.—Prices for cheap Steels are almost as numerous as the sellers. Open-Hearth Machinery and Spring are quoted at 2.05¢ @ 2.25¢ from mill, but large lots will be sold by some makers at even less. Best grades of Tire command 2.25¢ from mill, but other makes not so well-known can be had down to 2¢. Tool Steel is quoted at 6½¢ and upward.

Track Supplies.—Steel Rails pursue the even tenor of their way at unchanged prices—namely, $31.50 and upward. Fastenings are comparatively quiet, as it is now between seasons. Iron or Steel Splice Bars are quoted 1.80¢ @ 1.85¢; Spikes, 2.15¢ @ 2.25¢; Hexagon Nut Track Bolts, 2.65¢ @ 2.80¢. The sales of Steel Rails up to February 1, according to the report of the Board of Control, were 532,105 gross tons, standard sections, of which about 320,000 tons were taken by the two great Western plants and about 212,000 tons by the Cambria, Bethlehem, Lackawanna, Pennsylvania and Maryland put together. The Illinois Steel Company leads with more than one-third of the total sales. The shipments of all the mills during January were 64,746 tons.

Old Rails and Wheels.—Old Iron Rails are a drug, and consumers are not accepting them at $21.75. Old Steel Rails are bringing $14 for short pieces. Old Car Wheels are nominal at $16 @ $16.50. Some speculative interest in them has developed, but buyers will only take hold at prices considerably under quotations.

Scrap.—Wrought continues very dull, while the railroads are offering large quantities. Unless it soon begins to move, there must be a serious break in prices.

Cast Scrap and low-grade material are in reasonably good demand. Quotations are as follows, per net ton: No. 1 Railroad, $18.50; No. 1 Forge, $17.50; Horse Shoes, $18; Car Axles, $22; Fish Plates, $20; No. 1 Mill, $12.50; Pipes, $11.50; Sheet Iron, $8; Cast Borings, $7.25 @ $7.50; Wrought Turnings, $10; Axle Turnings, $12; Machinery Cast, $12.50; Malleable Cast, $9; Stove Plate, $9; Mixed Steel, per gross ton, $12.25; Coil Steel, $15.50; Leaf Steel, $17.75.

Metals.—Carload lots Lake Copper are quoted 10.75¢, and casting brands 10⅜¢. Spelter is nominally held at 4.50¢. Pig Lead has improved, with sales reported of 300 tons Desilverized and 160 tons Missouri at 3.90¢.

Matthew Addy & Co. of Cincinnati have appointed W. C. Hayward their Chicago agent, to succeed Albert C. Hawes resigned. Mr. Hayward is well known to the Pig Iron trade of the Northwest, and is especially well versed with regard to Southern Irons, having at one time been for a considerable period the Chicago agent of the Tennessee Coal, Iron and Railroad Company. He will retain the old office of the firm in Room 556 The Rookery.

William Chambers of Chicago has been engaged to represent the Haugh-Kurtz Steel Company of Indianapolis in the sale of Steel Castings to the Western trade. The company have just erected a plant at Anderson, Ind., for the manufacture of Open-Hearth Steel Ingots, Billets and Castings, with a daily capacity of 36 tons, and are prepared to turn out castings of any description from 50 pounds to 12 tons. They own their own gas well and have erected a fine iron building to guard against any interruption to their business by fire. The company, although a new organization, comprise business men of long experience, and their superintendent is especially well informed on the requirements of the Steel Casting trade. Mr. Chambers also thoroughly understands the Steel Casting business, having been engaged in it 13 years in England and nine years in the United States. He has secured the patterns of the late Chicago Crucible Steel Casting Company, which had been carefully preserved, and hence is in a position to promptly fill orders for the old customers of that establishment. The new company start off with good orders booked for mining, railroad and miscellaneous Castings.

Philadelphia.

Office of *The Iron Age*, 220 South Fourth St., PHILADELPHIA, Pa., February 23, 1892.

There is little or nothing to be said in regard to the Iron trade, beyond reiterating the statement that business is dull and prices weak and irregular. There have been some indications of a hopeful character, but on the whole the week's sales have not more than equaled the week's production, so that for all practical purposes the position is unchanged. Inquiries are more numerous, however, and some of the large consuming interests appear to be getting more business, and are therefore likely to have increased requirements for both Pig and finished material. Since date of our last report orders for several thousand cars have been placed, with some movement in the demand for locomotives, and prospects of quite a good sale for railway equipments. Bridge and ship building is not at all up to expectations, although there is plenty of talk of orders to be placed in the near future. The building trade has been quite disappointing, but there are good prospects in this department, and unless something unforeseen occurs there will be a heavy demand for Architectural Material before the season is very far advanced. Meanwhile orders are taken at extremely low figures, the immediate object being to keep moving until there is enough business to warrant better prices.

Pig Iron.—The best that can be said under this heading is that standard brands command a fair sale at unchanged prices, while other descriptions are hard to move on any terms likely to be satisfactory to holders. The truth is that too much Iron is being made, under which circumstances there are only two alternatives—lower prices, or a heavier demand. From present appearances there is not much room for hopes in regard to the latter, while in the meantime the burden is increasing and daily becoming more difficult to control. These remarks apply not so much to established brands as to those that have no friends, and which are constantly looking for a lodgment somewhere and on some terms. It is not known that large consumers have decided on a price at which they will take hold, and as there is still a good deal of Iron to be delivered on old contracts, the probabilities are that they will not be in any haste to make bids, unless for something likely to be more or less in the nature of a bargain. *Bradstreet's* on Saturday quoted No. 2x at $14.50, Perth Amboy, which is certainly not correct, the parties named as sellers giving an emphatic and unqualified denial of the entire transaction, or of any other that would approach it either in price or quantity. At the same time, it must be conceded that extremely low figures have been quoted, and in an emergency it is hard to say what might not be done. Specially low figures have been named during the past few days at such points as Baltimore and Harrisburg, or in fact at any point where large lots will be taken and paid for at short dates. The usual asking prices are about as follows for seaboard or near-by points, and from 25¢ to 50¢ less for the interior and South:

American Scotch, No. 1x	$18.00 @ $18.50
American Scotch, No. 2x	17.00 @ 17.50
Standard Penna (Lake Ore), No. 1x	17.50 @ 17.75
Standard Penna. (Lake Ore), No. 2x	16.00 @ 16.25
Standard Penna. (Lake Ore), No. 2 plain	15.25 @ 15.50
Lehigh and Schuylkill, No. 1x	17.00 @ 17.50
Lehigh and Schuylkill, No. 2x	15.25 @ 15.75
Standard Virginia, No. 1x	17.00 @ 17.25
Standard Virginia, No. 2x	16.00 @ 16.25
Medium Va. and Southern, No. 1x	16.00 @ 16.50
Medium Va. and Southern, No. 2x	15.00 @ 15.50
Standard Penna. and Virginia Forge	14 50 @ 15.00
Ordinary Forge Cinder mixed	13.75 @ 14.00
Hot-Blast Charcoal	20 00 @ 22.00
Cold-Blast Charcoal	25.00 @ 27.00

Steel Billets.—Business drags along, but without much change in prices, and, for that matter, there are no bids for large lots by which the market can be gauged. One or two lots of a few hundred tons each have been taken at $26, for delivery at mills near by, while offers to deliver at $25 @ $25.75 at Susquehanna points have been declined. There is some inquiry for May, June and July, but no agreement as to prices has been reached. Makers expect to get more money or to shut down their mills, and as buyers see nothing to warrant them in anticipating requirements at higher prices, there is a virtual stand off on both sides. March deliveries offered to day at $25.90 to mills near by.

Steel Rails.—Nothing doing except in small lots. Western mills are said to be taking in a good deal of work, but Eastern mills are not doing more than during the past three or four months, which is only a small portion of their full capacity. Prices steady at $30, at mills.

Bar Iron.—Demand does not improve, and mills find it hard work to keep things moving, even at the low figures now ruling. The orders for cars which have recently been distributed ought to help the mills a little, but the chasm is so wide and so deep that it will require an enormous amount of business to bring things into a reasonable condition of activity. Prices are nominally 1.70¢ @ 1.75¢ for city deliveries, and 1.60¢ @ 1.65¢ at interior points, but all depends on the kind of order that may be offered.

Plates.—A somewhat better demand has been met with, but without any corresponding improvement in prices. On the contrary lower figures than ever have been quoted on at least one large order for Boiler Steel, how low it is impossible to say with certainty, although those who quoted 2.25¢, delivered, say they were underbid. It is extremely difficult to give satisfactory quotations on such a market, but as a rule asking prices are about as follows, but on such specifications as above named, and calling for several hundred tons, heavy concessions are not hard to obtain:

	Iron.	Steel.
Tank Plates	1.80 @ 1.90¢	1.85 @ 1.95¢
Refined	2.20 @ 2.30¢	2.00 @ 2.10¢
Shell	2.30 @ 2.40¢	2.20 @ 2.30¢
Flange	3.20 @ 3.30¢	2.40 @ 2.50¢
Fire-Box	4.00 @ 4.25¢	2 60 @ 2.80¢

Structural Material.—The market is in a very satisfactory condition, although there is little more business offered, and quite a good deal in prospect. Prices are very unsettled, however, and as yet without any immediate prospect of improvement. Sales are reported at from 1.9¢ to 2¢ for Sheared Plates and Angles; 2.25¢ @ 2.40¢ for Beams and Channels, and 2.4¢ @ 2.5¢ for Tees.

Sheet Iron.—Market fairly active, but at irregular and extremely low prices for some makes. Best makes in small lots command about the following rates, subject to the usual concession on large orders:

Best Refined, Nos. 14 to 20	3.00¢ @ 3.05¢
Best Refined, Nos. 21 to 24	@ 3.10¢
Best Refined, Nos. 25 to 26	3.20¢ @ 3.25¢
Best Refined, No. 27	3.40¢ @ ....
Best Refined, No. 28	3.50¢ @ ....

Common, ¼¢ less than the above.

Quotations given as follows are for the best Open-Hearth Steel, ordinary Bessemer being about ¼¢ lower than are here named:

Best Soft Steel, Nos. 14 to 20	3¢ @ 3½¢
Best Soft Steel, Nos. 21 to 24	3½¢ @ ....
Best Soft Steel, Nos. 25 to 26	3¾¢ @ ....
Best Soft Steel, Nos. 27 to 28	4¢ @ ....

Best Bloom Sheets, ¼¢ extra over the above prices.

Best Bloom, Galvanized, discount	@ 67½ %
Common, discount	@ 70 %

Old Material.—It is extremely difficult to move anything except just what a buyer may happen to want. Under forced sales lower figures have to be accepted, but ordinarily prices are about as follows: Iron Rails, $20.50 @ $21 asked, spot, or $22 delivered; Steel Rails, $16.50 @ $17.50, delivered; No. 1 Railroad Scrap, $19.50 @ $20, Philadelphia, or for deliveries at mills in the interior $20 @ $21, according to distance and quality; $14.50 @ $15 for No. 2 Light; $14 @ $14.50 for best Machinery Scrap; $13 @ $14 for ordinary; $14 @ $15 for Wrought Turnings; $9.50 @ $10 for Cast Borings, and nominally $22 @ $24 for Old Fish Plates, and $16 @ $16.50, delivered, for Old Car Wheels.

Detroit.

WILLIAM F. JARVIS & Co. of Detroit, Mich., under date February 22, 1892, say: The demand for Coke Iron has continued fairly good during the past week, with prices unchanged, except for some particular grades, which have shown a slight tendency toward further weakness, and any further reductions now seem impossi-

ble. Certainly this seems a reasonable supposition with Gray Forge Iron selling at $9.25 @ $9.50, at the Southern furnaces. A fair demand for Ohio Softeners has also been seen, though prices for these special Irons are very well maintained. There have been positively no transactions in Lake Superior Charcoal Pig beyond a few carload orders, these going at full market quotations. The demand for this staple must increase from now on until midsummer. Many engagements have always heretofore been made in early spring for this metal, to be received via lake. Lake rates already established indicate an additional cost of about 25 % over 1891 figures for delivery to lower lake ports. We give quotations as follows:

Lake Superior Charcoal, all numbers	$17.00 @ $18.00
Lake Superior Coke, Bessemer	16.50 @ 17.00
Lake Superior Coke Foundry, all ore	17.00 @ 18.00
Ohio Blackband (40 per cent.)	17.50 @ 18.00
Southern No. 2	15.25 @ 15.50
Southern Gray Forge	13.50 @ 14.00
Jackson County (Ohio) Silvery.	18.00 @ 18.50

Pittsburgh.

Office of *The Iron Age*, Hamilton Building, PITTSBURGH, February 23, 1892.

February is drawing to a close and the expected improvement in the Iron market seems to be as far off as ever. In fact, business seems to be growing steadily worse, both as regards demand and prices, and it is very hard indeed to find any one who will venture an opinion as to when a change for the better will come.

Pig Iron.—As compared with prices of one year ago there has been a decline in the various grades of Pig Iron of from $1.25 to $1.75 ℔ ton At the close of February last year Bessemer Pig was selling at $16.50 @ $16.75, as against $15 @ $15.25, the prices nominally ruling here now. At this time last year the Coke strike was in full swing and that, of course, helped to keep up prices. Some of our furnacemen and dealers state that if we could have another Coke strike now that would last for three or six months it would be the best thing that could happen. The belief is general that the only remedy for the sick condition of the market is to administer a tonic in the shape of a shutdown, in order that the immense stock of Iron now held at a number of the furnaces may be worked off. There is certainly little or no profit to the furnaces at prices now ruling, and unless an improvement takes place pretty soon some concerns that are only moderately strong financially will soon be compelled to give up the struggle. One of the best-posted Pig-Iron makers in the Mahoning Valley recently sized up the situation as follows: "There is a great overproduction of Pig Iron, and in the territory tributary to the Lake Superior Ore region the largest stock ever held at one time, there being over 500,000 tons on hand the first of the month. If the freight discrimination against the two valleys were rectified and there would be a reasonable reduction in the price of Coke, we would hold our own againt any locality in the United States. We have already knocked out Southern Iron, so far as this market is concerned, and propose to keep it out. The consumption of Pig Iron is enormous, but the production more than keeps pace. There is no profit in the business at present." For the week under review there was a further falling off in sales and a further weakening in prices of Bessemer and Foundry Irons. We quote as follows:

Neutral Gray Forge	$13.25 @	$13.50, cash.
White and Mottled	12.50 @	13.00, "
All-Ore Mill	13.75 @	14.25, "
No. 1 Foundry	15.25 @	15.50, "
No. 2 Foundry	14.25 @	14.50, "
No. 3 Foundry	14.00 @	14.25, "
Bessemer Iron	14.90 @	15.25, "
Warm-Blast Charcoal	18.50 @	20.00, "
Cold-Blast Charcoal	25.00 @	27.00, "

Bessemer Iron from the valleys has been sold here at $15, delivered, and after deducting the freight and broker's commission it netted the furnace $14.20. It is reported that a small lot of Bessemer has been sold by a city furnace at $14.85, cash, for immediate delivery. Our firm is credited with having bought 25,000 tons within the last week at prices ranging from $15.25 down to $15. Ia is possible that additional shipments of Southern from the Sheffield, Ala., district, will be made to this and the Wheeling district if cheap river transportation can be secured, which is doubtful, as the carriers say that they cannot take the chances on it at $2.50 ℔ ton, which is understood to have been the price paid on the 2000-ton lot that arrived at Wheeling a week or more ago.

Ferromanganese.—The market continues the same, with quotations ruling at $62.50 @ $63 for 80 % domestic. No foreign has been sold in this market for a long time.

Muck Bar—The demand is exceedingly light. We quote at $25 @ $25.25, with what few sales going made at former quotations.

Steel Billets.—The market is very weak and we are advised of sales as low as $23.20 at mill for close delivery. For deliveries extending into April and May $23.75 @ $24 is asked by the mills. The extremely low price ruling for Billets is expected to increase the demand, as the belief is general that Billets at $23.50 are a pretty safe investment.

Wire Rods.—In sympathy with Billets, the market is weak, with transactions limited. Buyers seem to fear that prices will go lower, and are holding back orders. The new Rod mill of the Pittsburgh Wire Company has been started up. It is said to be one of the best equipped mills in the country. We quote nominally at $32.75 @ $33, and are advised of a sale of 500 tons at $32 50, f.o.b. at mill.

Manufactured Iron.—In finished material the situation is the same as reported last week. The mills are fairly busy, while some have enough to keep them fully employed. Some of the Bar mills making only the best grades of Merchant Iron seem to be busy all the time and have no trouble in getting highest market prices for their product. We quote No. 1 city-made Bars at 1.67½¢ @ 1.70¢, 60 days, 2 % off for cash. Old Rail Iron, 1.55¢ @ 1.60¢. The demand for Sheet Iron continues good, and we quote on a basis of 2.50¢ @ 2.60¢ for No. 24. Plate and Tank Iron is quiet at 1.90¢ @ 2¢. Skelp Iron continues dull, and we quote at 1.57½¢ @ 1.60¢ for Grooved and 1.77½¢ @ 1.80¢ for Sheared, four months, 2 % off for cash.

Nails.—The demand for Cut Nails does not show any improvement, and prices are without change. We quote at $1.55 in carload lots, for 30¢ to 35¢ averages, f.o.b. at factory, in Wheeling district. Wire Nails are held by the manufacturers at $1.70 in carload lots and $1.75 in smaller quantities.

Wrought-Iron Pipe.—Trade is reported very quiet, but manufacturers expect an improvement in the demand when the country roads, which are now almost impassable, have improved. Discounts remain as follows: Discounts on Black Butt Pipe, 57½ %; on Galvanized, 47½ %; on Black Lap Weld, 67½ %; on Galvanized, 55 %; Boiler Tubes, all sizes up to 2¾ inches, inclusive, 55 %; 3 inches and larger, 65 %; Casing, all sizes, 55 %; Inserted Joint Casing, 50 %. Sales continue to be made at from 5 % to 10 % lower than above lists.

Barb Wire.—The recent decline in prices has resulted in increased business and orders are pretty plentiful. Prices continue unsettled and we quote nominally at $2.25 @ $2.35 for Painted and $2.75 @ $2.85 for Galvanized, f.o.b. at factory.

Old Rails.—But little business is doing in either Iron or Steel Rails, particularly in the former. We quote Old Steel Rails at $16.75 @ $17 for short pieces; $17 @ $17.50 for miscellaneous length, and Old Iron Rails, nominally, $22 @ $22.50. We note sales of 2000 tons mixed pieces Steel at $17.

Structural Material.—A slightly better demand is noticeable, but complaint is made that business is not what it should be by any means. We continue to quote Beams and Channels on a basis of 2.40¢ @ 2.50¢. Angles, 1.90¢ @ 1.95¢, Tees, 2.50¢; Universal Mill Plates, 1.95¢ @ 2¢; One concern here that was a member of the Beam Pool have requested their employees to accept a cut of about 25 % in wages.

Merchant Steel.—Orders are reported fairly plentiful, but with the immense tonnage that our mills can produce, we could take care of considerable more business if it could be had. No change can be noted in prices, which remain as follows: Crucible Spring Steel, 4¢; Tool Steel, 6½¢ @ 10¢; Crucible Machinery Steel, 5¢; Bessemer Machinery Steel, 2.35¢ to 2.50¢.

Steel Plates.—There is a fair business, but there is plenty of room for improvement. Prices remain unchanged. Fire Box, 3.75¢ @ 4.15¢; Flange, 2.30¢ @ 2.35¢; Shell, 2.15¢ @ 2.20¢; Tank, 1.90¢ @ 2¢.

Scrap Iron.—The market is dull and the few sales going are at figures which leave little profit to the seller. We quote No. 1 Railroad Wrought Scrap, $18.50 @ $19 per net ton; Cast Scrap, $13 per gross ton; Steel Rail and Bloom Ends, $17.50 @ $18; Cast-Iron Borings, $9.50 per net ton.

Steel Rails.—No change to note. Prices remain at $30 for standard sections, f.o.b. at mill.

Railway Track Supplies.—No change to note either in demand or prices. Only a moderate business is doing. We quote as follows: Spikes, 2.15¢, 30 days; Splice Bars, 1.70¢ @ 1.80¢; Track Bolts, 2.65¢ with Square and 2.75¢ for Hexagon Nuts.

(By Telegraph.)

The Association of Iron and Steel Sheet Manufacturers met at the Monongahela House yesterday. The meeting was well attended, about 15 concerns being represented in person and a number by letter. J. G. Battelle of Piqua, Ohio, president, and N. C. Cronemeyer of Pittsburgh, secretary. By-laws and constitution were submitted and adopted by the association, and reports were read from the four scale committees appointed at the previous meeting. These committees represented sheet-bar mills, tin-plate mills, sheet mills and fire-bed mills. After receiving the reports of these committees an Executive Committee of three was appointed, and will draw up a wages scale for each of the above four kinds of mills. As soon as these scales are ready they will be sent to each mill and submitted by each individual concern to the sub-lodges of the Amalgamated Association for their consideration. This will be done in order that the sub-lodges may report to the general convention of the Amalgamated Association of Iron and Steel Workers, which will be held in Pittsburgh

in June next. One suggestion that was made and will be adopted if possible was that all day hands, as far as practicable, be put on a tonnage basis. The manufacturers are not making any attempt to reduce wages, but are endeavoring to correct some discrepancies that have crept into the wages paid by Sheet mills. A committee was also appointed to call on the American Tinned-Plate Manufacturers' Association of the United States, which will meet at the Monongahela House to-day, for the purpose of proposing to the above organization the combining of the interests of the Association of Iron and Steel Sheet Manufacturers and those of the American Tinned-Plate Manufacturers' Association into one body. The interests of the firms belonging to the two associations are so closely identified, that it is believed it will be beneficial to join the two bodies together. Another committee was appointed to confer with the Amalagamated Association and the National Association of Roofers, for the purpose of establishing a standard gauge by act of Congress. No other action of importance was taken.

The partnership heretofore existing between Wm. J. Morris, Robt. Bailey and H. J. Williams under the firm name of Morris, Williams & Bailey, manufacturers of Cold-Rolled Steel at Pittsburgh, has been dissolved. The business will be continued at the old location by Wm. L. Morris and Robt. Bailey under the firm name of Morris & Bailey.

Cleveland.

CLEVELAND, February 22, 1892.

Iron Ore.—It now seems probable that during the excitement incident to the unexpected opening of the market the amount of Ore already sold was slightly over-estimated. It is now believed that the sales of Bessemer Ore for 1892 will not greatly exceed 3,250,000 tons, although they may reach 3,500,000 tons. There is a pause in the demand for Ore just at present, a result due to the uncertain condition of affairs in the Pig Iron trade and the falling off in the demand for Billets and other products. Buyers of Mill Iron are doing practically nothing, and will not for a few weeks to come. The rush from the docks to the furnaces keeps up. 30,000 tons have been sent along from Cleveland last week, against 13,000 tons for the same week last year. The docks at lower lake ports have not been so well cleared up at this season of the year for many seasons. If the present pace is maintained the first cargoes of Ore for 1892 will be dumped upon barren wharfs. Only a few unimportant sales have occurred since the last report. A few additional charters have been made, but the rates—$1 from Escanaba, $1.15 from Marquette and $1.25 from Ashland—remain the same.

Pig Iron.—The market is still so inactive that the interruption of a national holiday seems to have no perceptible effect upon the situation. It seems hardly probable, however, that this dull condition can long exist, as consumers' stocks must be very low and there must be a buying movement soon. Some dealers believe that the market will be in really good condition within 30 days, although it is admitted that there is little except history upon which to base such a conclusion. One furnaceman said to day: "If sellers would organize a boycott, refusing to sell an ounce of Iron for present prices, the revival would come soon enough." Only a few unimportant transactions are reported, and these at prices about as low as even buyers would have the audacity to offer. Despite all this the furnacemen are hopeful and seem to anticipate a substantial change for the better very soon.

Scrap.—The market does not maintain the improvement noted a week ago. No. 1 Railroad Wrought is in some demand at $18.50 @ $19, and Cast Scrap at $13.50, but the market is weak.

Old Rails.—The market for Old Americans continues a bit weak, with a few sales reported at $22.

Manufactured Iron.—The mills are well engaged for some time to come. There is still a fair demand for Common Bar at 1.65¢ @ 1.70¢. Sheets are scarce and high, and with the approach of spring Structural Irons seem to be wanted.

Louisville.

LOUISVILLE, KY., February 20, 1892

Pig Iron.—The market has been extremely quiet, what sales were effected being on basis of $9.50 for Gray Forge, Birmingham, which has been the ruling figure for several weeks. Contracts for long delivery, basis $9.75 for No. 2 Soft and $10.75 for No. 1 Soft, Birmingham, have been made. Consumers report a scarcity of orders, which prevents their buying at the present moment, though the offerings at prevailing low prices are considered very advantageous. The manufacturers who have depended largely upon Southern trade especially have felt a contraction in their business. Only in special lines, like car companies, is work abundant; the prices, however, at which contracts for cars are taken necessitate practicing every economy in their manufacture, but the demand has been much greater than last year. There has been considerable Iron sold by Western houses and the demand there has been active, with purchases for delivery running into the fall on basis of present quotations. A new furnace, the Embreville, is going in blast immediately, feeling that there is a special demand for the character of iron they will produce with the Embreville Ores and Pocahoutas Coke. The product will be largely Foundry grades of great strength and their Mill Iron one that will produce a Muck Bar nearly all fiber. We quote cash, f.o.b. cars, Louisville:

Southern Coke, No. 1 Foundry	$14.00 @ $14.50
Southern Coke, No. 2 Foundry	13.00 @ 13.50
Southern Coke, No. 3 Foundry	12.50 @ 12.75
Southern Coke, Gray Forge	12.00 @ 12.25
Southern Charcoal, No. 1 Foundry	15.75 @ 16.75
Southern Car Wheel	18.00 @ 19.00

Cincinnati.

(By Telegraph.)

Office of *The Iron Age*, Fourth and Main Sts., CINCINNATI, February 24 1892.

There has been little increase in the volume of business during the week, for consumers are not disposed to buy Iron much in advance of their necessities. There have been some sales of 1000 or 2000 ton lots on private terms, and in some cases it is understood that exceptionally low prices were made, but there have been sales at pretty full quotations for desirable deliveries and of Iron which had been tried and found satisfactory. As a rule there are abundant offerings of Southern Coke Iron, and the fact that production continues abundant in the face of low prices is taken as evidence that it is not unprofitable. But there is a scarcity of Neutral Coke Iron and it is in good demand. Standard Southern Car-Wheel Charcoal Iron is also in good request and the Napier Iron Works, whose furnace had long been idle, have been induced to resume operations, as they now have railroad facilities and can better compete with other furnaces. Generally speaking, there is more inquiry for Pig Iron for forward delivery and there are several negotiations in progress that may be completed at an early day. There appears to be less disposition to sell for the last half of this year and many furnaces will not entertain any such bids, but there are some who will sell a little beyond July. We give revised quotations for several grades of Iron:

Foundry.	
Southern Coke, No. 1	$14.50 @ $14.75
Southern Coke, No. 2	13.50 @ 13.75
Southern Coke, No. 3	12.75 @ 13.00
Ohio Soft Stone Coal, No. 1	16.00 @ 16.50
Ohio Soft Stone Coal, No. 2	15.00 @ 15.50
Mahoning and Shenango Valley	17.00 @ 17.50
Hanging Rock Charcoal, No. 1	19.75 @ 20.00
Hanging Rock Charcoal, No. 2	19.00 @ 20.00
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00
Forge.	
Gray Forge	12.25 @ 12.50
Mottled Neutral Coke	11.75 @ 12.00
Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	19.75 @ 20.00
Lake Superior Car Wheel and Malleable	18.75 @ 19.00

St. Louis.

Office of *The Iron Age*, Bank of Commerce Building, ST. LOUIS, February 22, 1892.

Pig Iron.—Another week has come and gone and left the market, if anything, in even worse condition than it found it. Prices continue weak, and while it does not seem possible for them to go lower, there is nothing in the situation to base hope for any advance, and furnacemen will consider themselves fortunate if they are able to hold prices at present prevailing. Even this latter hope does not seem to have much foundation to rest on, and indications point to a still lower range of prices. As was explained in our report two weeks since, overproduction is the burden which is keeping the market down to its present low level, and until this feature has been eliminated either by a curtailment of production or a largely increased demand, the possibility of any advance in prices seems too distant to place any strong hope in. The market is in a precarious condition and it will not be surprising to hear of some furnaces "blowing out," as they have to be peculiarly well located to make money at the prices ruling to-day. A limited trade is reported at about current rates, although the size of the order has much to do with the price. For moderate sized quantities the quotations below are the basis on which these sales are made. We quote as follows for cash f.o.b. St. Louis:

Southern Coke, No. 1 Foundry,	$14.75 @ $15.25
Southern Coke, No. 2 Foundry,	14.00 @ 14.25
Southern Coke, No. 3 Foundry,	13.25 @ 13.75
Gray Forge	12.75 @ 13.00
Southern Charcoal, No. 1 Foundry	16.75 @ 17.25
Southern Charcoal, No. 2 Foundry	16.00 @ 16.50
Missouri Charcoal, No. 1 Foundry	15.25 @ 15.75
Missouri Charcoal, No. 2 Foundry	14.75 @ 15.25
Ohio Softeners	17.75 @ 18.75

Bar Iron.—Trade is not as brisk as it was two weeks since, although the car builders continue to buy quite freely. Jobbers report a falling off in the demand, and prices are being shaded to secure orders. Mills are not too plentifully supplied with orders and are busy skirmishing around to keep the books as well filled as possible. We quote as follows: Car lots at East St. Louis, 1.70¢ @ 1.75¢, half extras; small lots from store, 1.85¢ @ 1.90¢, according to quantity.

Barb Wire.—Mills continue to keep well employed and jobbers report an increased demand. The Southwestern trade is unusually heavy for this season and gives promise of a larger demand as soon as the weather settles enough to take outside work. Prices are better maintained than was anticipated, and are quoted as follows: For less than car lots, Painted, $2.60; Galvanized, $3.10. Carload orders are quoted at 10¢ ₱ hundredweight less than these prices.

Wire Nails.—A fairly active trade is reported in this department. Mills are maintaining the recent advance. Jobbers also report an active trade and dealers have evidently come to the conclusion that the recent advances made in Wire Nails have come to stay. Moderate sized orders are filled at the $2.05 rate, while jobbers quote $2.10 @ $2.15 for small lots. Car lots command $1.95.

(By Telegraph.)

Pig Lead.—A sudden change has taken place in this department. Sellers ask 4¢, while sales of several hundred tons are reported at 3.95¢. The situation is much stronger, and while no tremendous advance is anticipated, a steady increase in value is pretty sure to result.

Spelter does not improve in any sense whatever. Offerings are free at 4.30¢, with bids at 4.25¢. Sales have been made for delivery extending through the next four months at 4.30¢. The stocks in smelters' hands are increasing, and while this continues any improvement in prices seems out of the question.

Rogers, Brown & Co. report that in 1891 they sold 387,283 gross tons of Pig Iron, and 66,601 net tons of Steel, Coke and Coal, the invoice value of this material at destination being $6,060,000. The iron was shipped from 48 different blast furnaces, the sales being made by 16 salesmen to over 800 different customers. The entire losses by bad debts during the year were less than $\frac{1}{10}$ of 1 %, a good proof of the stability of the Iron trade. January sales were 46,405 tons.

New York.

Office of *The Iron Age*, 96-102 Reade street, }
NEW YORK, February 24, 1892. }

American Pig.—The market is very dull, and there is general complaint of sharp cutting, even the standard brands of Northern Irons being worked off at a concession through special channels. Southern and Virginia furnaces are making sacrifices in a number of cases, and rumors of very low prices are frequent. We quote Northern brands, $16.50 @ $17.50 for No. 1; $15.25 @ $16 for No. 2, and $14 @ $14.50 for Gray Forge, tidewater. Southern Iron sells at $15.75 @ $17 for No. 1; $15 @ $15.50 for No. 2 and No. 1 Soft, $14 @ $14 25 for No. 2 Soft; $13.50 @ $14 for Gray Forge.

Ferromanganese and Spiegeleisen.—We note a sale of 5000 tons of 10 to 12 % foreign Spiegeleisen, special brand, to an Eastern Rail mill at $23 50. Ferro is dull. We quote at $23 @ $23.50 for 10 to 12 %, $26.50 @ $27 for 20 %, and $62 @ $62.50 for 80 % Ferromanganese.

Billets and Rods.—In Steel Billets low offerings are being made from the Pittsburgh district. Foreign Wire Rods are very low, and sales of several thousand tons have been made in the Canadian market, the foreign price being 110/, f.o.b. Antwerp. For this coast nothing has been done in foreign, which we quote nominally at $42.50 @ $42.75; domestic Rods are quotable at $36.50 @ $37, tidewater.

Manufactured Iron and Steel.—There is little doing in Beams, and no season contracts are reported. It is estimated that the leading architectural works of this city have contracted for previous to the break and have still to receive about 7000 tons of foreign Beams, which they will probably find it necessary to work off before taking hold of American stock. Buyers have very pronounced views as to what they ought to be able to buy American Beams for. They talk 2¢, delivered. What little business is doing is being done at the range of 2.3¢@ 2.5¢ for Beams and Channels. A part of the Broadway cable road power house has been taken. The specifications for McComb's Dam bridge, for which the bids will be opened on March 9, show that A. P. Boller has receded from his position to limit manufacturers to Acid Open Hearth. The specifications call simply for Open Hearth.

Steel.—During the week a contract has been placed for 750 tons of structural material for gas house work at Worcester, Mass. We may note that the New York Central has placed orders for 3000 cars, one-half going to Buffalo and the otherto the Michigan Company. The Lehigh Valley has placed 1500 cars with the Milton works. Ship Plate orders continue to hang fire. We quote: Angles, 1.90¢ @ 2.10¢; Sheared Plates, 1.85¢ @ 2.25¢; Tees, 2.40¢ @ 2.75¢, and Beams 2.30¢ @ 2.80¢; Channels, 2.30¢ @ 2.50¢, on dock. Car Track Channels, 2¢ @ 2.10¢; Steel Plates are 1.85¢ @ 2.1¢ for Tank; 2.15¢ @ 2.30¢ for Shell; 2.40¢ @ 2.65¢ for Flange; 2.60¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock. Bars are 1.7¢ @ 1.9¢, on dock. Scrap Axles are quotable at 2¢ @ 2.20¢, delivered. Steel Axles, 2¢ @ 2.2¢, and Links and Pins, 2.1¢ @ 2.20¢; Steel Hoops, 1.95¢ @ 2.05¢, delivered.

Merchant Steel.—We quote: Hot-Rolled Shafting, 1.90¢ @ 2¢; Machinery, 1.90¢ @ 2.10¢; Tire, 2¢ @ 2.25¢, and Toe Calk, 2.20¢ @ 2.35¢, delivered.

Steel Rails.—Orders continue very scarce, and no transactions of magnitude have been placed. The report of the Board of Control shows that sales up to the 1st of February were about 200,000 tons greater than last year, or about 525,000 tons. The Cleveland Rolling Mill Company are getting ready to start on Rails. Prices remain $30, at Eastern mill. In the West Light Rails are being sold at relatively low prices.

Track Material.—Rumors of low prices continue to disturb the market. We quote Spikes, 1.95¢ @ 2.05¢; Angles, 1.65¢ @ 1.70¢, and Bolts, 2.60¢ @ 2.75¢, delivered.

Metal Market.

Copper.—It has been current report that the Calumet and Hecla Company have recently taken orders for about 10,000,000 lb of Lake Superior Ingot at 10½¢ for March and later delivery. Intimations dropped by consumers supposed to have been interested as buyers appear to have been the foundation of the report. The meager information imparted by the alleged sellers suggests a doubt as to the accuracy of the report, however, and some consumers, who think that they would not be overlooked in the event of orders being taken at the price named, assert that they have no knowledge of the transactions as reported. There seems to be a general impression, however, that some fire is behind all the smoke, and that 10½¢ is nearer actual market value for large lots than are the prices currently quoted for small parcels. Of the latter there have been sales at 10.60¢ @ 10.65¢, and subsequent bids of 10.60¢, it is reported, were refused; 10.65¢, however, would buy in some quarters. Casting brands for prompt delivery are not in full supply as yet, but the offering for near future delivery is freer and at somewhat lower prices. Small parcels are quoted at 10⅝¢ on the spot, and futures are offered at 10¼¢, without attracting a great deal of business.

Pig Tin.—Prices have averaged lower the past week and the market has presented a dull, dragging appearance. In a measure this condition of affairs was the result of irregular and lower average prices cabled from London, but local influences evidently carried greater weight. Certain it is that outside speculative interest affords no basis for successful local manipulation, since outstanding obligations are kept within narrow limits, while the competition for trade and consumptive orders is still so keen that values respond more quickly to a downward turn than to any movement in the opposite direction in the foreign market. During the past week 10-ton lots of Straits have been sold at from 19.65¢ down to 19.55¢, and spot parcels at as low as 19½¢, net cash, on local dealings. Out of town orders have been taken at prices nearly on a level with these. At the close the offering was more reserved, owing apparently to better cable advices, and the market firmer at about .05¢ @ .07½¢ advance from the lowest point For ordinary jobbing parcels 19¼¢ @ 19½¢ was quoted.

Pig Lead.—Under the influence of very reserved offering by smelters, consequent upon the labor strikes at the mines in the Idaho district, the market has gained additional strength and a further advance in prices has been established on actual transactions. Single carloads brought as high as 4¼¢, 50-ton lots went at 4.20¢, and bids of 4.15¢ for larger quantities were refused. The volume of business has not been remarkable, nor have consumers manifested any alarm, but the trading, such as it has been, would indicate that, were requirements more urgent, still higher prices would have to be paid unless the European markets came into play as an offset. A few inquiries sent abroad have already served to bring about an advance of 7/6 in the price of Spanish Lead in London, but it is problematical whether several good-sized orders from this side would cause foreign holders to look for still higher prices or to make the most of the opportunity that might be offered to unload some of their burdensome supply.

Spelter.—The market looks weaker just now than it has at any previous time this month. As a rule sellers of Western brands quote 4.65¢ for carloads, and name 4.60¢ as a close price for larger quantities, but offers made within a few days at as low as 4.57½¢ have met with indifferent reception. To all accounts consumption is well up to the average for the season, but large output and liberal stocks at the smelting works have a depressing influence.

Antimony.—There is little or no change in the character of the demand, and prices are still rather weak. On wholesale quantities the quotations are 11¢ for Hallett's, 12¼¢ @ 13¢ for LX, and 15¢ @ 15½¢ for Cookson's.

Tin Plate.—In this line business has been running in much the same groove as operations were conducted in during the preceding week, and there is no radical change in the general situation or in prices. On the spot there is a full supply of full-weight Cokes, for which the outlet at present is very narrow, also a fair quantity of sizes and brands that are just now out of favor, but

otherwise a comparatively moderate stock. Full-weight Cokes, it may be in place to remark, are offered on spot at 12½¢ @ 15¢ per box below present cost of importation, while in nearly all other lines, Wasters excepted, futures are the cheapest by 5¢ @ 15¢. We quote as follows for full weights: Coke Tins—Penlan grade, IC, 14 x 20, $5.25; J. B. grade, do., $5.35; Bessemer do., $5.30; Siemens Steel, $5.37½. Stamping Plates—Bessemer Steel, Coke finish, IC basis, $5.60 @ $5.65; Siemens Steel, IC basis, $5.75 @ $5.80; IX basis, $6.80. IC Charcoals—Melyn grade, ½ X, $6.35; for each additional X add $1.50; Allaway grade, $5.75: Grange grade, $5.85; for each additional X add $1.20, Charcoal Ternes — Worcester, 14 x 20, $5.75; do., 20 x 28, $11.37½; M. F., 14 x 20, $7.37½; do., 20 x 28, $14.75; Dean, 14 x 20, $5.50; do., 20 x 28, $10.60; D. R. D. grade, 14 x 20, $5.35; do., 20 x 28, $10.25; Mansel, 14 x 20, $5.40; do., 20 x 28, $10 50; Alyn, 14 x 20, $5.45; do., 20 x 28, $10.50; Dyffryn, 14 x 20, scarce; do., 20 x 28, $10.90. Wasters—S. T. P. grade, 14 x 20, $5.10; do., 20 x 28, $10; Abercarne grade, 14 x 20, $5; do., 20 x 28, $9.65.

Coal Market.

The Anthracite Coal trade remains in the same stagnant condition noted for some time past, despite reports to the contrary designed to keep the market for "coalers" on the Stock Exchange. Most of the Coal that is being delivered is Coal sold at what is technically known as the "drop prices," meaning the prices that prevailed for a short time at the recent break, when the Wilkesbarre and in fact nearly all the companies joined in a general scramble to sell all that was possible for what they could get. But there is reason to believe that no Coal is sold at present except at the circular prices. Broken may be quoted $3.50 @ $3 60; Stove, $3.75; Chestnut, $3.25, f.o.b., net; Pea, $2.25 @ $2.75, according to quality; Buckwheat, $1.90 @ $2.25. At the office of the sales agents nothing is yet heard of the details of contemplated changes, whatever they may be, growing out of the recent combine. The inference is that conservative methods will prevail, at least as long as any question may exist with reference to the legal status of the deal. Production for the week ending February 13 was 700,243 tons, compared with 651,593 tons in the corresponding week last year, an increase of 48,647 tons. The total amount of Anthracite mined thus far in the year is 446,000 tons less compared with the same time in 1891. Shipments of Coal over the Pennsylvania Railroad, 262,000 tons; Coke, 118,709; Reading tonnage for the week, 250,000.

The Pittsburgh Coal Exchange adopted resolutions condemning Senator Frye's bill for the regulation of boilers in the marine service. The bill has already passed second reading in the House.

A Tamaqua dispatch says the Reading management have issued orders to suspend work on the new branch line to connect with Coxe's new road to the colleries.

British Iron and Metal Markets.

[*Special Cable Dispatch to The Iron Age.*]

LONDON, WEDNESDAY, February 24, 1892.

In price of Scotch warrants there has been a further decline, and the market is still in a very unsettled condition. On the 18th inst. the syndicate ceased buying, whereupon other holders began to realize, and over 10,000 tons changed hands at 40/6. Subsequently there were liquidations at 40/, and some transactions at a shade less. The last statement shows 502,000 tons in Connal's stores, which is about the average for some time past, but additional furnaces have been lighted, and there are now 78 in blast. The increased production, along with slow shipping demand, makes the situation appear critical. English and Hematite warrants were somewhat adversely affected by the decline in Scotch, but have since became firmer at 35/7½ and 45/6 respectively. The stock of Cleveland warrants is still 157,000 tons.

Finished Iron trade is unsettled, owing chiefly to threatened stoppage of work at collieries.

Operations have been suspended at the West Cumberland Iron Works, owing to depression in business.

Pig Tin, after some display of firmness, declined £1. 5/, owing chiefly to absence of speculation, but there has since been a recovery of 12/6, chiefly under the influence of better consumptive demand. Straits shipments continue large.

Free selling caused a decline of 12/6 in Merchant Copper and from that there has been only a slight recovery. In the speculative interest the "bears" evidently predominate, and are favored by quietness of trade, but any improvement in demand causes "shorts" to cover, as available stocks are light. American Copper is in poor request. The Anaconda Company offer Matte freely for March delivery, but English smelters refuse terms regarding assay.

Business in Tin Plate continues moderate, and is still confined chiefly to irregular sizes and light gauges. No further important concessions in makers' prices.

Scotch Pig Iron.—The demand for makers' brands continues slow and prices still lean in buyers favor:

No. 1 Coltness,	f.o.b.	Glasgow	54/
No. 1 Summerlee,	"	"	50/6
No. 1 Gartsherrie,	"	"	50/6
No. 1 Langloan,	"	"	51/6
No. 1 Carnbroe,	"	"	43/6
No. 1 Shotts	"	at Leith	53/
No. 1 Glengarnock,	"	Ardrossan	51/
No. 1 Dalmellington,	"	"	48/
No. 1 Eglinton,	"	"	47/

Steamer freights, Glasgow to New York, 1/; Liverpool to New York, 7/6.

Cleveland Pig.—Business is moderate, and the market is barely steady at 35/9 for No. 3, f.o.b. Middlesborough.

Bessemer Pig.—Only a fair business passing, but makers firmer at 48/ @ 48/6 for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—Market slow and prices are without change. English 20 % quoted at 80/, f.o.b. shipping port.

Steel Rails.—There is a fairly active movement and the market is steady. Heavy sections quoted at £4. 5/, f.o.b. shipping port.

Steel Blooms. — Market remains very quiet. Makers ask £4. 5/ for 7 x 7, f.o.b. shipping point.

Steel Billets.—No change in these, business continuing slow. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. shipping point.

Steel Slabs.—The market remains dull and unchanged. Bessemer quoted at £4. 5/, f.o.b. at shipping point.

Old Iron Rails.—There is rather more doing and the market is steadier. Tees quoted at £2. 17/6 and Double Heads at £3, f.o.b.

Scrap Iron.—Values are steady and the demand is very fair. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—A slow movement at old prices. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Tin Plate.—No change in prices and the demand moderate. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/ @ 14/6
IC Bessemer Steel, Coke finish	@ 12/6
IC Siemens " " "	@ 12/9
IC Coke, B. V. grade 14 x 20	@ 12/6
Charcoal Terne, Dean grade	12/ @ 12/3

Manufactured Iron.—There has been no improvement in sales in any line and prices remain as before. We quote, f.o.b. Liverpool:

	£	s.	d.		£	s.	d.
Staff. Ordinary Marked Bars	8	10	0	@			
" Common "	6	10	0	@			
Staff. Bl'k Sheet, singles	7	10	0	@			
Welsh Bars (f.o.b. Wales)	5	10	0	@	5	12	6

Pig Tin.—The market at the close was quite firm. Straits quoted at £89. 2/6, spot, and £89. 10/ for three months.

Copper.—Prices rather firmer at the close. Merchant Bars quoted at £43. 15/, spot, and £44. 17/6, three months' futures. Best selected, £47. 6/.

Lead.—Business more active and the market firmer at £10. 15/ for Soft Spanish.

Spelter.—Demand has improved and prices are steadier at £21. 12/6 for ordinary Silesian.

PERSONAL.

W. H. Keeler, recently of Jamestown, N. Y., has been elected a director, secretary and manager of the Nevada Mining Company, with an office at Webb City, Mo.

H. C. Crowell, manager of the Crowell Clutch and Pulley Company of Westfield, N. Y., has been appointed mechanical engineer and superintendent of the engineering works at Dunkirk, N. Y. Charles J. Carney, the former superintendent of the works, has accepted the position of engineer of machinery and superintendent of the Brooks Locomotive Works.

S. H. Chauvenet has resigned the post of general manager of the Virginia Development Company. We understand also that E. C. Pechin is to sever his connection with the same concern.

W. T. Flanders & Co. of Nashua, N. H., have contracted to put in a plant for tinning cast iron at the works of the Peck, Stow & Wilcox Company at Southington, Conn.

The Ohio Legislature is about to inquire into the effect of prison labor on outside industries.

Charles Merrill, who is still living, entered business on his own account in 1824. He commenced his business experience as a clerk with L. & T. Seymour, Chatham square, New York, in 1816. Mr. Merrill is over 90 years of age and enjoys good health, though he is now entirely blind.

HARDWARE.

Condition of Trade.

TRADE CONTINUES in fair but not heavy volume, and some disappointment is expressed that the demand has not as yet reached as large proportions as was expected. Our advices from several leading jobbing points in the West indicate a satisfactory increase in business and a quickening in the demand, and from many parts of the country reports come of a good condition of retail business which results in fair purchases at present, with the prospect of a continued call for goods during the season. The fact that orders from the South are much less than usual has the effect of reducing considerably the sale of goods to that section, which of late has been a market of growing importance, and the absence of Southern orders has something to do with the disappointment in regard to the aggregate volume of business. In the matter of prices the market remains steady, without indications of much improvement in its general tone. Collections, as a whole, may be characterized as fair, with some complaints in regard to sluggishness, especially in the South.

St. Louis.

(By Telegraph.)

Jobbers report a steady trade, more particularly for Shelf Goods. Salesmen are sending in good orders and the general outlook can be called encouraging. Country dealers are complaining somewhat, but the local trade is in good shape. Some complaint is heard regarding prices, which in some lines have reached a point that is pretty close to cost. Wire Nails, Barb Wire and Tinware are ordered freely, but the business in Cut Nails is disappointing. Shot is in good demand. There is little or no complaint regarding collections.

Chicago.

(By Telegraph.)

The better demand for Hardware noted last week has sustained itself and the spring trade now seems to be in full swing. There is a difference of opinion with regard to its volume. Several prominent houses report an improvement over the corresponding period of last year, while others claim that they have not yet caught up to the high water mark reached at that time. The difference in these views is perhaps accounted for in this way: The demand last year was unusually heavy for staple goods and the falling off in this respect must be felt by the houses especially prominent in that line. Others are making a stronger effort to push straight Hardware and these are the ones who are most cheerful over the situation. The demand for staple goods this year seems to be very healthy and would appear to be preferable to the speculative demand of last year, when small merchants ordered carloads of Wire Nails and Barb Wire. Nearly every order now includes some staple goods, but they are limited to the buyers' actual wants in those lines. Shot has receded to $1.35, while Rope has made another advance. The outlook continues excellent.

Notes on Prices.

Cut Nails.—There is very little change in the Cut Nail market since our last report. The demand is fair and prices without improvement or weakening. Quotations are on the basis of $1.45 at mill for either Iron or Steel Nails in round lots. New York quotations are $1.55 to $1.60 on dock, small lots from store being held at $1.65 to $1.75.

Chicago, by Telegraph.—Steel Cut Nails have undergone no special change in the past week. The local makers are well supplied with orders extending into March. Quotations range from $1.60 to $1.65, Chicago, on 30-cent average. Jobbers quote $1.75 for small lots from stock, with 5 cents off for mixed carloads.

Wire Nails.—The Wire Nail market continues even and steady, with a good amount of business, Quotations are on the basis of $1.75 at mill, a figure from which concessions are in special cases given.

Chicago, by Telegraph.—Wire Nails are well held at the advanced rate lately established, and a good run of business is reported both by manufacturers and jobbers. Carload lots are quoted at $1.90, and small lots from stock $1.95.

Barb Wire.—There has been a good deal of inquiry in regard to Barb Wire, and a considerable quantity has been purchased, but large buyers are in many cases still feeling the market. As a general quotation $2.65 for carload lots of Four Point Galvanized, at mill, may be named, a figure which is in some cases shaded, but, on the other hand, a few of the manufacturers refuse to meet it. New York prices are on the basis of $3.10 for small lots of Four-Point Galvanized, carload lots being held at $3. These figures are, however, shaded to a greater or less extent.

Chicago, by Telegraph.—Manufacturers report an active condition of business, with the largest mills now running to their full capacity in order to supply the trade. They quote factory lots of Painted, $2.45, Chicago, with 50 cents advance for Galvanized. Jobbers quote $2 55 for mixed carloads of Painted and $3.05 for Galvanized, with 5 cents per 100 advance for small lots.

Bright Wire Goods.—At the recent meeting of the manufacturers of Bright Wire Goods it was thought advisable to make a reduction in price in order to make the regular quotation approximate the figures at which the goods irregularly, though not infrequently, have of late been selling. The new price is such as to permit the sale of the goods generally at discount 85 per cent.

Shot.—The associated manufacturers of Shot have adopted new prices, which are announced under date 22d inst. These prices are as follows, terms, net cash 30 days, or 2 per cent. discount for cash in 10 days, an additional discount of 20 cents per 100 pounds being allowed in lots of 2000 pounds and upward taken at one time:

Drop shot up to B, 25-pound bag	$1.35
" " " 5 " "	.35
Drop shot B, and larger, 25-pound bag	1.60
" " " 5 " "	.40
Buck and chilled, 25-pound bag	1.60
" " 5 " "	.40
Dust shot, 25-pound bag	2.00
" 5 " "	.45

Cordage.—The National Cordage Company have made another advance in the price of Rope. By this action the base price of Sisal is made 10¼ cents, subject to the usual discount of 1 cent per pound, f.o.b. factory, and 1½ per cent. discount for cash.

Butcher Knives, Cleavers, &c.—Nichols Bros., successors to E. S. Hulbert & Co., Bernardston, Mass., have issued a new catalogue relating to their manufactures, which is referred to in another column. They also issue the following discount sheet applying to the catalogue:

	Discount.
Knives:	
Butchers' (except Assoc. pattern)	50 %
" Association Pattern	Net.
Steak	50 %
Skinning	50 %
Sticking	50 %
Ripping	50 %
Pork	50 %
Boning	50 %
Fish	50 %
Splitting	50 %
Patent Skinning	50 %
Jewelers'	50 %
Cooks'	50 %
Cheese	50 %
Butter	50&10 %
Bread	50 %
Kitchen	50 %
Slicers:	
Hotel	50 %
Ham	50 %
Royal	50 %
Carving Knives and Forks	50 %
Pot Forks	Net.
Steels:	
Stag Handle	50 %
Diamond Guard	50 %
Ebonized Handle	50 %
Kitchen	50 %
Cleavers:	
Market	30 %
Boston Pattern	30 %
Pork Choppers	30 %
Family	30 %
Lamb	30 %
Packing House	30 %
Beef Splitting	30 %
Splitters:	
Lamb, New York Pattern	30 %
" Regular	30 %
Beef	30 %
Spades, Butter and Lard	50 %
Trowels, " "	50&10 %
Miscellaneous:	
Jewelers' Knives	50 %
Hairing " 13-inch	50 %
Basket	50 %
Corn Cutters	50 %
Tobacco Hatchets	30 %

Leffingwell Automatic Ash Sieve.—Chas. Leffingwell, 55 Eighth avenue,

Newark, N. J., manufacturer of this Ash Sieve, has made a reduction in the price, by which it is now sold at $12 per dozen and $1 each. The terms are f.o.b. cars Newark, net cash five days after receipt of goods.

Glass.—The advance in the price of Glass made at the Cleveland meeting, held on February 16 and noticed in our last issue, is reported to take effect immediately. The rates agreed upon are: For 1000-box lots or more, 80, 10 and 5 per cent. discount, and for car lots 80 and 10 per cent. discount. The actual freight allowed is not to exceed the Chicago carload rate, which is 17½ cents per hundredweight. For smaller lots the discount is to be 80 and 5 per cent., f.o.b. at factory. The action is reported as unanimous, the manufacturers being united upon the desirability of putting the business upon a better paying basis. The revision of the present price-list, which work is now in the hands of a committee, will have the effect, it is understood, of further advancing the price of Glass. It is stated that the reports from the different manufacturers showed stocks in their hands to be small and the outlook generally promising. The meeting of the Plate Glass Manufacturers' Association, held in this city during the past week, resulted in no arrangement of a scale of prices nor the establishment of a rebate system. Quotations upon the new basis are as follows: American Window Glass, 1000-box lots or more, 80, 10 and 5 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount; French Window Glass, 75 and 10 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

Trade Items.

C. E. WOODRUFF, Northern Office Building, Chicago, who has for many years been identified with the Western Hardware trade, has consummated arrangements direct with manufacturers for a full line of Shelf and Heavy Hardware and Cutlery, which he proposes to sell direct to the trade, taking practically the position of a jobber. Associated with him are D. L. Morgan, well known to the trade through his long connection with Kelley, Maus & Co., and W. A. S. Brooks, who was formerly with Hibbard, Spencer, Bartlett & Co. The combination is an excellent one, covering all essential requirements in the trade to be covered. Mr. Woodruff's personal acquaintance among Hardware merchants is very extensive and his knowledge of the requirements of the Northwestern trade is especially intimate. He will cultivate the entire field from Chicago to the Pacific Coast. Mr. Woodruff will continue to purchase for a large number of Western merchants on a salaried basis, giving such customers the benefit of manufacturers' prices, with all rebates, freight allowances, special discounts, &c.

AT THE ANNUAL MEETING of the Johnston Harvester Company, Batavia, N. Y., held January 30, the following officers were chosen for the ensuing year: B. E. Huntley, president; E. J. Mockford, vice president and secretary; E. W. Atwater, treasurer. The company state that they are in excellent condition in every respect, and that they anticipate a much larger trade this season than ever before.

THE DINNER.

THE FIRST BANQUET of the Hardware, Metal and kindred trades since 1860 was held at Sherry's, Fifth avenue and Thirty-seventh street, Tuesday evening. There was present one of the largest and most enthusiastic assemblages of guests ever gathered within this handsome and justly popular dining hall. It was certainly the largest trade dinner ever given in the City of New York.

The occasion was memorable on account of the number and position of the guests, and the exceptional excellence of the speeches, which were eloquent and instructive, full of wit and wisdom, and pervaded by a kindly fraternal spirit, which happily accorded with the temper of the assemblage. It will doubtless long be remembered as an occasion which brought together many who were familiar with one another's names and who in many cases have dealings together, but who never before had the opportunity of meeting socially under similar circumstances. Most of those present were naturally connected with New York houses, but there were many from other cities, notably Philadelphia, Baltimore, Buffalo, Albany, Rochester and Syracuse. Many manufacturers from Connecticut and other States were also present, and in this way the gathering was a thoroughly representative one of the jobbing and manufacturing interests which center in New York. It also, without doubt, represented much larger and more extensive interests than any similar assemblage which has ever been held in this country.

An Annual Dinner.

When in the course of his remarks David Williams referred to the desirability of having a dinner next year, the favor with which the suggestion was received was evidenced by the hearty applause which was given to it, and whenever a similar reference was made in the subsequent addresses it was likewise received with marked approval. In conversation, also, the desirability of having annual dinners was frequently alluded to, and it may be regarded as the wish of the trade that an opportunity shall thus be given regularly to come together in a social way.

The Executive Committee.

Much credit is deservedly given to the Executive Committe for the efficient manner in which they performed their duties in attending to all the details in connection with the banquet. So complete were their arrangements that no trouble or difficulty was experienced in any part of it, so that in every respect the affair was a complete success. It is a matter of congratulation that the delicate task of assigning seats at the table was performed in so satisfactory a manner. The suggestion that the same committee be intrusted with the getting up of the next dinner is deserving of consideration, thus utilizing the valuable experience they have gained.

The matter of the organization of a Hardware club or association of some kind is now prominent in the minds of the trade. When William H. Williams in his felicitous speech in response to the toast "Pins and Needles" suggested the desirability of forming some kind of an association of the Hardware and related trades it was apparent that the suggestion was in accordance with the ideas of a large proportion of the trade and any reference to this matter was received with marks of approbation. It is certainly desirable that the trade should give early attention to this matter and determine what form a movement in this direction should assume.

In view of the fact that the Executive Committee is a representative one, has the confidence of the trade and is recognized as having arranged the dinner just held with efficiency, care and success, would it not be desirable for them to take in hand the preliminary work looking toward the organization of a Hardware association or club in such form as may seem best? Their proceeding in this matter would doubtless meet with general approval.

The Tables.

The guests' table was arranged at the north side of the banqueting hall and was occupied by the chairman, speakers and guests. Extending at right angles from this table were seven other tables, each of which accommodated 49 persons, there being also an annex table in an adjoining apartment. The guests' table was particularly handsome and was elaborately festooned with smilax and hot-house plants.

Webster R. Walkley of Peck, Stow & Wilcox Company was chairman and presided in his well-known graceful and efficient manner. On either side of him, as named below, were representatives of trade organizations, the speakers and other gentlemen occupying a prominent position in the community, together with many well known to the Hardware trade:

JONATHAN H. CRANE,
G. WALDO SMITH,
EVAN THOMAS,
MARCUS C. HAWLEY,
GEORGE H. SARGENT,
SAMUEL A. HAINES,
WILLIAM H. MCELROY,
DAVID WILLIAMS,
HON. DAVID H. GOODELL,
REV. A. J. F. BEHRENDS, D.D.,
REV. JAMES M BUCKLEY, D.D., LL.D.,
WEBSTER R. WALKLEY, *Chairman*,
HON. ABRAM S. HEWITT,
HON. JOSEPH B. SARGENT,
WILLIAM W. SUPPLEE,
RICHARD R. WILLIAMS,
FAYETTE R. PLUMB,
WILLIAM H. WILLIAMS,
CHARLES A. MOORE,
FRANCIS B. THURBER,
DAVID M. STONE,
JOHN C. TUCKER,
ARCHIBALD P. MITCHELL.

The hour before the banquet was pleasantly spent by the guests in a social way,

and was scarcely long enough for introductions and the meeting of old friends. A pleasant surprise was expressed by many at finding there so many whom they knew, but whom in many cases they had not met for years.

Numbers.

The number of the guests, as shown on accompanying diagrams, together with those who were seated in the annex, was nearly 400, and included representatives of the largest manufacturers of the country and the very extensive commission and jobbing interests of New York and other cities.

A comparison of the diagrams herewith given with that recently published of the 1860 dinner will show how much larger was the one just held. But this is an inadequate indication of the increased interests represented in it, as the business of the city and country has greatly developed, and the trade done by the houses represented at the late gathering is many times greater than that of the 1860 gathering.

HON. ABRAM S. HEWITT.

Souvenir of Hardware Dinner, with name of Guest.

Cordial Feeling.

When the guests were seated at the tables it was evident that not only many lines of business were represented, including Hardware and all of its related branches, but that all ages were on hand in goodly numbers. There were present several who were at the 1860 dinner and a good many who have been for a long period of years identified with the trade. There was, however, a large proportion of the younger men, who could appreciate only in part the references to the condition of things a generation ago. A genial and cordial feeling pervaded the occasion, and any reference to the amenities of business and the desirability of promoting acquaintance were received with evidences of hearty approval. The company up to the late hour at which they dispersed were in the best of spirits and appreciated the excellent remarks with which the banquet closed.

Dinner Souvenir.

One of the features of the dinner was a souvenir presented with the compliments of the *The Iron Age*, containing the *menu*, toasts, diagrams of the tables, names of members of committees and of the gentlemen present.

This was a handsome book 5¼ x 9½ inches in size, containing 16 pages of rough edge hand-made paper, held in place by a white silken ribbon. The covers of the book were in white silk-finished binding, the inside of which was lined with special paper, a close inspection of which showed minute engravings of Hardware, Tools, Cutlery, House-Furnishing Goods, &c. On the outside of the front cover was a bronze figure 3 x 4¾ inches in size, of Vulcan at the Forge, done in bold relief; together with the inscription: "Dinner of the Hardware and Metal Trades, New York, 1892." Underneath the figure the name of each guest was printed in gold. After the title page, space was devoted to the names of the Committee of Arrangements and of the Executive Committee. Opposite this was the *menu*, followed by two pages devoted to a list of the toasts. The succeeding nine pages contained, in the following order, a plan of the tables, names of the chairmen and guests, and the seven tables, lettered from A to G, inclusive, with the name of each participant at the place he occupied at the tables. The last two pages of the book were left blank, with the exception of the word "Autographs" at the top. The souvenir was an entire surprise to those attending the dinner, whose kindly commendatory remarks left no doubt as to their appreciation of it. Many autographs were obtained during the evening to remain as pleasant personal reminders of the enjoyable occasion.

Before the dinner was served grace was said by Rev. A. J. F. Behrends, D.D., after which the following *menu* received the attention of the guests:

MENU

HUITRES
Blue Points

POTAGE
Crême Homard

HORS D'ŒUVRE
Cornet à la Russe
Olives Radis Celery

POISSON
Chicken Halibut Portuguese

RELEVÉ
Filet de Bœuf Bourgeoise
Pommes Parisiennes

ENTRÉE
Soufflé au Jambon
Petits Pois

SORBET

RÔTI
Bécassines au Cresson
Salade

ENTREMETS SUCRÉS
Pudding Glacé Duchesse
Gâteaux Bonbons
Marrons Fromage
Fruit Café
Wines à la Carte

Toast List.

The toast list was carefully prepared, and it was a matter of congratulation that all the speakers were present, with the exception of Hon. William J. Coombs, whose absence was much regretted. The list of toasts is given on next page.

While the dinner was in progress, Stub's orchestra discoursed classical selections and popular airs of the day, including such favorites as "Annie Rooney," "Maggie Murphy's Home," and negro melodies.

The Chairman's Address.

After the coffee and cigars had been distributed Chairman Webster R. Walkley arose, and, calling the assemblage to order, extended his greeting in the following eloquent address:

Gentlemen, merchants and manufacturers of hardware, of iron and steel, of brass and tin, and honored invited guests, my first words must be words of welcome. This is a feast of laborers, of toilers, and the welcome is from each to the other. We all stand upon a common platform, and our kindly greeting to all—to the youngest and humblest in our ranks as well as to the invited friends, who adorn almost every trade and profession, and who grace this occasion by their presence.

The hour and the event are auspicious. Already we feel a kindlier touch, warming our sympathies, broadening all our nature; for at this hour we speak in a language unknown in the busy marts of trade. The

idioms of our offices—discounts, per cents., quality, weight, finish—are forgotten. We look deeper into each other's hearts and find there undiscovered mines of wealth, jewels of rare brilliancy which sparkle and flash in the sunlight of truth. We feel, act and speak the truth unbiased, unprejudiced and uncolored. We are as frolicsome as children. Health blooms on our cheeks and joy laughs in our eyes. Charity covers our faults and Happiness throws her silken robes about us. May the hour help us to know each other better. May better thoughts pervade our hearts, stimulating us to greater achievements and help us to discover nobler traits in manly men.

These better thoughts should influence our lives. They have always been the inspiration of every heart, the aspiration of every soul, the climbing to a higher life, a feeling after liberty. Better thoughts have in all ages moved men to do and to dare, to perform deeds which the world calls heroic. There are angels ascending and descending upon the ladder, like unto that which Jacob saw. Though its foot is upon the solid rock, its top reaches beyond the clouds, beyond the stars and the sun, to the throne of the eternal God. [Applause.]

We are and have been living in stirring times. We live in perhaps the most important epoch in the history of the world. Marvelous work has been accomplished by the implements of our trade and manufacture. Railroads have been builded across the continent, rivers and mountains have been tunneled, and to-night men's thoughts invade the caverns of the sea. How large has been the lot of liberty!

The dream of the New England poet made our whole country as a favored park, stretching northward, eastward, westward and southward, in an area the extent of which has been realized in our day. Many of us have been permitted to clasp hands with the most illustrious of earth's sons.

These walls are made vocal with the praises of our beloved Washington [applause], and some ear more finely attuned may catch the reverberating echoes this very morning. Yet, to my mind, the name of one who has lived with us, who has been an actor in life's drama with us, though we may have played in minor parts, is more illustrious than that of Washington. Each revolving year adds luster to his name and glorifies his fame.

To speak that name 'mid all this festive cheer—
A name through all our land so loved and dear,
Would wake such joy in this exultant throng,
That voice of praise, loud echoes would prolong.
O noble man, of great and gen'rous soul,
As years go by and into ages roll,
Thy name, thy fame, thy deeds, thy life, thy love
Will light the way that leads from earth, above.
With Samson strength he struck and fetters broke,
Which bound three million souls 'neath slavery's yoke.
By alchemy divine these links were wrought
To chains of gold that drew him to the God he sought.
No need of mine to speak that name your thought
Suggests. In warp and woof of life 'tis wrought.
Yet, best and noblest man of all our race,
The friends we greet loved Lincoln's honest face.

Progress has been our friend and companion. She has stood by our side in every advance that we have made. She has not been lame, or halt or blind. She has stood erect like a god. Her head has been above the clouds. She has laughed at the lightnings and held them in her hand, and watched her corruscations and flashes as men hold jewels. At her giant tread the mountains glow and the earth shakes. She has opened the ways of progress. The land and the sea have yielded up their treasures.

Science has been our servant; and an Almighty providence has smiled above us and poured into our lap the wealth of nations. My words must be few, and yet avenues of thought are open in every direction; avenues paved by the discoveries, inventions and achievements of the living, glorified by heroic and immortal deeds of heroic and immortal men; avenues stretching back through the troubled years of this generation, wherein so much has been wrought for the liberty of the press; avenues reaching toward the future, where Genius, with hammer and trowel, builds bridges and temples more colossal and grand than mind yet has planned or the human hand has yet erected; avenues stretching from the arch of triumph erected by the Nineteenth Century, eastward over undulating fields adorned by art and nature, over rivers of silver to mountains of gold; avenues stretching to the cold of the north, to the heat of the south and to the glorious sunset of the west; avenues reaching back beyond Cæsar and Napoleon, beyond Rome and her Cæsars, beyond Greece and her arts, beyond that hour when Genius gave life and immortality to Art, back of Joshua and Moses, and back in the beginning to infinity—reaching beyond time to infinity and from God to God. [Applause.]

I would not let this hour pass without saying one word to the younger men whom we greet here to-night. [Applause.] I would leave them with one single thought. Genius is a bird of rare plumage. You cannot harness it to your chariots. It is not your servant to do your bidding. But work, perseverance, industry, untiring energy and character will surely tell in the race of life. Was it Carlyle who has said that older than all the preached gospels is this inextinguishable, ineradicable, forever-enduring gospel? "Work and therein have your well being." Work while it is called to-day, for the night cometh wherein no man can work.

If a thistle grows in thy pathway pluck it up, that a blade of useful grass and a drop of nourishing milk may grow there instead. The whole world is full of examples illustrating what may be accomplished by untiring industry. That is one idea.

TOASTS.

1. *Hardware Dinners*, - - - MR. DAVID WILLIAMS.

1860—The Interval—1892.

Time ne'er forgot
His journey, though his steps we numbered not.—*William Habington.*

2. *The Iron and Steel Industries—Their Progress and Development*, - - HON. ABRAM S. HEWITT.

The golden hour of invention.—*Isaac Disraeli.*

3. *Past and Present of Manufacture*, - HON. J. B. SARGENT.

The painful smith, with force of fervent heat,
The hardest iron soon doth mollifie,
That with his heavy sledge he can it beat,
And fashion to what he it list apply.—*Spenser.*

The mill will never grind with the water that is past.—*MacCallum.*

4. *Iron and Theology*, - REV. JAMES M. BUCKLEY, D.D., LL.D.

The words of the wise are as nails.—*Ecclesiastes.*

5. *Subjective Hardware*, - MR. WILLIAM H. MCELROY.

The narrowest hinge in my hand puts to scorn all machinery.—*Whitman.*

6. *The Future of Manufacture*, - HON. DAVID H. GOODELL.

A business with an income t its heels.—*Cowper.*

7. *The Ethics of Trade*, - MR. FAYETTE R. PLUMB.

I did it with my little hatchet.—*G. W.*

8. *Pins and Needles*, - - MR. WILLIAM H. WILLIAMS.

Grapple them to thy soul with hooks of steel.—*Hamlet.*

9. *Our Commercial Organizations*, - MR. F. B. THURBER.

A merchant of great traffic through the world.—*Taming of the Shrew.*

10. *Hardware and Politics*, - - HON. WILLIAM J. COOMBS.

Glory and gain the illustrious tribe provoke.—*Pope.*
Private credit is wealth, public honor is security.—*Junius.*

11. *Our Commercial Travelers*, - - MR. SAMUEL A. HAINES.

Remote, unfriended, melancholy, slow.—*The Traveler.*
Traveling is no fool's errand.—*Alcott.*

12. *The Distribution of Hardware*, MR. WILLIAM W. SUPPLEE.

Who can answer where any road leads to?—*Owen Meredith.*

This year commemorates one of the most glorious discoveries in the history of the world. Four hundred years ago this very year a poor wayfarer in humble guise stood knocking at a convent door in Andalusia, begging bread. A month later, 400 years ago perchance this very night, this same adventurer stood before the walls of Grenada, the most brilliant hero of the most brilliant triumph in Spanish history. You know the result. He sailed out upon an unknown sea into the mystery of the ocean, in the chaos of the deep, seeking a new world.

I read from his log book: "After setting sail our course was due west. The third day we held our course boldly to the west. The fifth day we sailed boldly to the west." And thus he continued until on the 12th day of October, 1492, out of the chaos of the deep sprang this new

world, the reward of 18 years of faithful toil. [Applause.]

Gentlemen, we have received letters from the President of the United States [applause]; from the Secretary of State [applause]; from the Secretary of the Navy [applause]; from the Secretary of War [applause]; from Governor Flower [applause]; from Hon. W J. Coombs; from the Hon. Seth Low; from Mayor Grant; from Mayor Boody and from other distinguished gentlemen. I will read the one from our fellow laborer, Hon. William J. Coombs:

WASHINGTON, February 23.

Important public duties prevent attendance at the dinner this evening. Please present my regrets and best wishes. Assure the friends that in the performance of my public duties I shall always be on the side which favors commerce and secures sound currency. [Applause.]

The First Toast.

At the conclusion of the remarks of Mr. Walkley, the Double Quartette of the Orpheus Society of New York, consisting of the following gentlemen: C. L. Bonsall and C. H. Botsford, first tenors; Frank C. Hoyt and Alexander White, second tenors; Scudder Smith and G. Safford Waters, first bases, and E. L. Peck and James R. Strong, second bases, rendered in admirable style "Life's Golden Springtime," to the gratification of the company, after which the chairman introduced David Williams, whom he referred to as having contributed very much to the success of the dinner, who responded to the first toast "Hardware Dinners." After the applause had subsided Mr. Williams said:

Mr. Chairman and Gentlemen: In view of the history of the trade in New York during the past 32 years, the sentiment which has been allotted to me in its reference to Hardware dinners is strikingly suggestive of the historic toast of "Snakes in Ireland"—conspicuous by their absence. Snakes were once to be found in Ireland, and Hardware dinners were given in New York in the remote and almost legendary period before the war. [Applause.]

It is just the time ordinarily counted as a generation since the last Hardware dinner. The men of that day enjoyed friendly companionship, social intercourse and the pleasures of the table as much as we. Why did they not maintain the goodly custom so heartily begun? The answer is to be found in the conditions of the times.

The last Hardware dinner was given in a period of such excitement as they alone may realize who can look back to it. All the nation glowed with the heat of conflicting interests and passions. The thunders of the storm which was soon to break into the greatest and bloodiest conflict of modern times were then rumbling in the distance, and before a year had passed and the time for another annual dinner had arrived that storm had gathered and the sky was dark. States had seceded from the Union and our flag had been fired on at Charleston. No time then for dinners, but rather for patriotic energy and preparation for the struggle that was to come. Besides, business was in chaos, old houses in every line were tottering, and the strongest were uncertain and fearful of the future.

Nor was the beginning of 1862 a time propitious for such a dinner. The banks had just ceased cash payments, and in response to what the English called a firm note we had surrendered to them Mason and Slidell. The war was raging and continued with varying fortunes until, by 1865, the success of our army seemed assured; trade was prosperous, men were cheerful, but the vicissitudes of business, the wiping out of Southern debts, and the consequent bankruptcy of houses which had been engaged in Southern trade, the diversion of business into new channels and the springing up of many new concerns, had greatly changed the *personnel* of the trade and lessened the old fraternal feeling.

The habit of meeting one another had died out and the idea of a trade dinner did not occur to them.

How much for a generation has been lost from lack of social intercourse we can appreciate to night. How much the harshness of competition might have been mitigated by friendly acquaintance had the trade continued its commendable practice of the time before the war. How many a man sitting at a social dinner beside his neighbor, whom he had regarded merely as a ruthless and perhaps unscrupulous competitor, would have found the human side of his character and voted him a jolly good fellow, for believe me your good dinner is very often that one touch of nature which makes all men kin. [Applause.]

In all the years that have intervened since then the trade have had no gatherings at which the new accessions to its ranks might be welcomed, and at which a word of affectionate remembrance might be spoken of departed members. Of these the roll is long. Comparatively few of those who met together in 1860 are with us here to-night. Most of those whose faces we miss have set an example worthy of our imitation and left a memory which we cherish.

I shall only speak of one, the glorious old man of whom an eminent divine only voiced the universal sentiment when he said a few weeks ago from his pulpit: "Dear old Peter Cooper did more good for mankind than Dante and Milton, even had they been writing about Paradise from the beginning of the world." Although he has gone, his work and his reputation are worthily maintained by his successors, one of whom is with us to-night. [Applause.]

Of the survivors of that dinner there are a number present, some who, after many years of business cares and toil, are nearing the close of well-spent lives; others, in the strength of their manhood, may look forward to the possibility of eating another dinner 30 years from now.

But, gentlemen, the hours are short and the list of speakers long, and I know that I am putting into words simply the natural reflections that must occur to all of us. I do not wish you to think of me as Ike Bose, the bummer, felt toward General Sherman, whose army he was following on the march to the sea.

One chilly morning they were fording a particularly wide and shallow river, when, after splashing in the wash for what seemed to him altogether an unconscionable time and were only half way across, he turned to his companion and said with disgust: "Cracky, Jim, Uncle Bill is crossing this durned river lengthways."

I will therefore close with the hope and confident expectation that the trade will allow no interval longer than a year to come between this and the next Hardware dinner, and that the Governor of New Hampshire may never have such another opportunity as he has to-night of saying to the Mayor of New York: "It's a long time between meals." [Laughter and applause.]

The Second Toast.

The chairman then introduced Mr. Hewitt, whose subject was "The Iron and Steel Industries—Their Progress and Development," in the following remarks:

Gentlemen, among the pleasant things connected with the correspondence pertaining to this dinner was our interview with Mr. Cooper, the son of Peter Cooper, who had promised us to be here to-night, and who expressed great pleasure at the prospect of meeting with those whom he termed his fellow laborers. But at the very last moment Edward Cooper was taken sick and cannot be here. But we have in his place a gentleman who has always had the courage of his convictions—a man whom you all honor and love, a friend of our flag,

The flag of our stars,
Athwart whose white and crimson bars
The bright beams of the glorious sun
Still shine to greet each loyal one.

I have the pleasure of introducing to you the Hon. Abram S. Hewitt. [Applause.]

Mr. Hewitt responded as follows:

Mr. Chairman and fellow tradesmen, we are here to-night to represent an ancient and honorable calling, which came into birth when Adam delved and Eve spun, for I suppose that after the first meal in Paradise was eaten, with such disastrous results [laughter], it was necessary to go out into the outer world and get some tools by which an honest living might be made. [Applause.] Our business, therefore, is cotemporary with the origin and propagation of the human race. Although Hardware dinners seem to be few and far between, I take it that Hardwaremen will continue to exist until the last syllable of recorded time.

During my long experience in this sort of affairs I have observed that the toasts are assigned to the speakers upon two principles. Some are given toasts in order that they may amuse the audience, and that is the better part of such an arrangement, because after a hearty dinner we are not in a position to digest hard facts; nevertheless there are usually certain other persons who are selected as a foil for the witty and amusing orators who are to be found at all these public dinners. To them is given some particularly indigestible subject—such as "The Iron and Steel Industries—their Progress and Development." [Laughter.] At the dinner of the Ohio Society on Saturday night, Governor Campbell (who, like myself, is a Democrat) was invited to respond to a toast, and I believe it was "Ohio;" but being a possible Presidential possibility, he felt it necessary to talk for 55 minutes. [Laughter.] Now, as I am not a Presidential possibility I propose to cut my speech down. I know you want to know whether I am going to say 50 minutes, or five minutes; and so I will be merciful to you, and say five minutes.

I was one of those who was present at the dinner 32 years ago. I was then a young man, sitting down at one of the side tables; and about 4 o'clock in the morning (I had forgotten the fact) I was called up and made a response. I do, however, recollect that in this identical seat (I do not mean in this room, but in this seat, arranged as the dinner was on that occasion) sat my venerable father-in-law, Peter Cooper [applause]; and he was then curiously enough (as I am now) in his seventieth year. He lived for 23 years after, and there was but little abatement in his forces during that time. His speech on that occasion I still remember.

We were all then, as Mr. Williams has told you, in great trepidation because we thought the Union was in danger. Although we ate that dinner in pleasant association with each other, yet the pall of the coming conflict was over it. No speech was made on that occasion, so far as I remember, but dealt with the great question of the preservation of the Union. I remember well that Mr. Cooper's speech

was devoted to that subject, for he thought the Union of the States was the greatest treasure that a good Providence had ever conferred upon the human race [applause], and that it was to be preserved at all hazards.

I remember that for the year following those of us who thought we were patriotic devoted ourselves to the effort of compromising the irrepressible conflict. But it would not down. As the chairman has told you, the chains of 3,000,000 of men were clanking before the civilized world; and much as we business men thought it our duty to observe the constitutional guarantees and to make every effort toward compromise, those efforts were in vain, and for the coming four years we had upon our hands the most gigantic struggle that the world has ever seen, waged at a cost fabulous in amount, and accompanied with a loss of life unequaled in any other conflict, but in its results worth all the treasure and all the lives which a preserved Union deserved. [Applause.]

Now I will take my departure at that point and turn to the consideration of the toast which has been assigned to me; but I assure you that my statistics will be very few indeed.

At that time we had about 32,000,000 of people. We were producing about 800,000 tons of iron per annum. In other words, we were producing about 55 pounds per head. Our consumption was twice that amount, and we were importing as much as we produced. That was 30 years ago. To-day we are producing 10,000,000 tons of iron. Our population is 64,000,000. While we have doubled our population, we have also increased our product of iron and steel tenfold. [Applause.] In other words, we are consuming between four and five times as much iron for every inhabitant of this country as we were in 1860.

What does that mean? It is a dry fact, but it has a great moral significance. It means that the world has advanced in civilization, and in all the advantages, comforts and privileges of life, and that these privileges have advanced fourfold as rapidly as the population. In other words, the world has progressed to such an extent that if we were to take away the increase which has been made in the ratio of consumption we should think that we were dwelling in the midst of barbarism.

Go back to 1860, and almost every element which distinguishes modern civilization would be absent. We had, indeed, the telegraph, but we had no telephone. We had, undoubtedly, the steam engine, but we had no electric power. We had iron, at a very high price at that time, while steel was at least four times the price of iron. To-day steel is sold everywhere in the world at less than the price of iron. So that all that pertains to modern progress and civilization is the creature of our day and generation.

This generation has advantages, privileges and possibilities which never existed in any previous age. I know that it is the privilege of trades when they meet together to glorify themselves, and to become mutual admiration societies, but I can say with all truth that if any trade or profession in this country is entitled to the credit of these marvelous achievements and these wonderful results it is the trade which has assembled here to-night in hospitable converse. [Applause.]

Now, if wealth has increased (as it has) four times more rapidly than population, there is some cause for it; there is some reason to be found why it has been reserved for the close of the nineteenth century to bring about this extraordinary, this unparalleled result. Some people will say that it is our great resources. But you all know that other countries have great resources in other parts of the world who have made no progress. Some will say that it is the system of popular education which we have had, but, on the other hand, other nations have perhaps as a whole been more highly educated than we have.

To what, then, are we to attribute these marvelous results? So far as I can judge they are due to the kind of government under which we have had the felicity to live. [Applause.] And, among men, they are more surely due to that illustrious man who was "first in war, first in peace and first in the hearts of his countrymen." [Applause.] For, although I will not yield to your chairman in admiration of the great services of Abraham Lincoln [applause], although I will not yield to him in admiration, I cannot go with him when he puts Lincoln, great as he was and noble as he was, ahead of the father of his country! Washington was not merely the leader of our armies; he was the father of the Union. It was his personal influence which brought together the convention which substituted the Constitution for the Confederacy. He presided over the convention, and after the adoption of the constitution it was his personal appeal to every leading man in the country—the men who had served under his orders, who had trodden with bare feet from Massachusetts to Georgia—it was by his influence with them that he barely succeeded in getting the Constitution adopted.

In that Constitution there were the germs of this great development which we have witnessed in our day. There were three provisions in that Constitution which have made this country what it is. The first was that no State should establish any money as legal tender except gold and silver. The second was that no State should pass any law impairing the obligation of contracts. The third was that no man shall be deprived of life, liberty or property without due process of law. There are the three jewels that were set in the crown of American freedom. They left every man free to use his talents, his time and his labor as he would. They provided that when he had made a contract he should be bound by it, and that other people should be bound to him. And lastly, they provided that all contracts should be measured in an invariable money—a standard of value which should never be altered by the action of the States. [Applause.]

Armed with these amulets we faced the world; and to-day, as the result, we are the richest, the freest and the greatest among nations. Shall we continue in this career of progress? I could easily figure out for you that while we may make 10,000,000 tons of iron this year, by the year 1900 we ought, in the ordinary course of things, to make 14,000,000 or 15,000,000 tons; and that this march of progress ought to proceed without interruption. But I cannot predict it with any certainty. In the year 1855 I predicted what we would be doing in the year 1890 within about 200,000 tons [applause], which shows that a prophet is not always without honor in his own land, because I have had to wait 35 years to get recognition. I cannot predict the future with any certainty; I can only say that it depends upon the solution of certain great problems before us to-day. We are now in a state of fermentation. We do not see our way clearly out of it; and no man can predict what will come out of it, except that there is a Providence that rules the world, and we believe that all our troubles will be solved, and that we shall ultimately reach the clear daylight of justice and final prosperity.

We must have, if this progress is to go on, honest money. [Applause.] Any proposition from any quarter whatsoever which undertakes to nullify the spirit of the Constitution of George Washington, Alexander Hamilton and James Madison, which seeks to degrade the standard of value 30 per cent. by act of Congress, must be frowned down by the indignant protest of every American citizen. [Applause.] More than that, the right of men to labor where they will, and in what calling they will, and at what wages they will, must be asserted against all the uprising of ignorance, prejudice and jealousy—and, I might add, of spoliation—but I will not, for it is simply the ignorance of a great class amongst us as to their own best interests which has led them astray in this particular. But all combinations looking to the fettering of industry, to the restriction of production, to interfering with the right of the laborer to work where he will and how he will, must come to an end, or else the progress which we have made for the last 30 years will come to an end. [Applause.]

I would be very unwilling to have you infer from anything that I have said that I deny the right of association either to employers or to workmen. It is a right as sacred as the right to not associate. If you choose to associate, it is all right. If you choose not to associate, it is within your right. But when you associate together for the purpose of preventing somebody else from exercising his right, whether you be a manufacturer or a laborer, then you violate the fundamental law upon which the progress of society rests. [Applause.]

I told you that I would only take five minutes, and I presume I am within my mark. ["Go on." "Go on."] I will only say in conclusion that I have been led into this course of remark—perhaps inappropriate, and certainly intolerable if it were not that this committee assigned me this heavy toast upon which I might have taken two hours if I had wanted to; and I think you ought to be very grateful to me for having been so merciful.

I can only say now, in looking around upon this audience, that I do not say that I have lived too long, but this much I can say—that I see before me a generation that knows not Abram, although I have no doubt you know Moses and the Prophets. [Laughter] I do not allude to the profits of last year's business, however. I am sure you must feel that to come together in this way, whether we know each other or not, to see those who are passing off the stage, and who perhaps have not disgraced their trade, and for them to become acquainted with those who are to succeed them, and who present such an intelligent and highly moral appearance as I observe here to-night, is a good thing.

I remarked to Dr. Buckley (who is to tear what I have said to pieces in a few minutes) that a good many of you looked like clergymen [laughter], and that the rest of you, with a very few exceptions, looked like saints, although I have no doubt there are some sinners among the younger men; but that I would advise him, in case he wanted to buy a bill of Hardware (or anything in my line) not to trust too much to the confiding appearance of this crowd. [Laughter.]

I thought it might be well for him to be put on his guard, as I believe that he is at the head of a newspaper, and the newspaper men are notoriously so easily taken in when they come to interview you. I was informed by an interviewer to-day, who asked me a few questions which I civilly answered, as he went out, he said: "Well, I don't think you are half as bad a bear as they told me you were. They told me that it would be as much as my life was worth to interview you."

I will not say to Dr. Buckley, or Dr. Behrends, that it is as much as his life is worth to have a transaction with a Hardwareman; on the contrary, so long as they preach to them they will be all

right; but when they want to have any little business transaction with them I certainly think they had better know less of theology and more of business. [Applause.]

The Third Toast.

After a song by the quartette the chairman then introduced Hon. J. B. Sargent, who spoke as follows in response to the toast "Past and Present of Manufacture:"

Mr. President and Gentlemen: The toast to which I am to speak is that of the past and future of Hardware. The beginning of the manufacture of Hardware was when the colonies were first planted. The manufacture of Hardware in this country began with the planting of the New England colonies. The colonists probably brought some tools with them to Plymouth Rock and probably to James River; but almost immediate repairs were to be made and new tools were required. Then the man who is on the front of this *menu* was called into existence—the country blacksmith—and he is the father of the Hardware trade in the United States.

Every town, every village, every cross road in the more thickly settled parts of the country in the New England States had its blacksmith, generally a most intelligent and ingenious man, a man who could make anything that was wanted in the community in the way of tools and repairs in iron, and who could do all sorts of jobs requiring ingenuity and talent. From time to time he increased his tools of trade, until at last the tools became machines.

It might be interesting to the younger part of this assembly, at least, to note down the progress of Hardware in the colony of Massachusetts and afterward in Rhode Island especially. The first smelting furnace was started in America at Plymouth, very early after the arrival of the colonists. In 1700 iron foundries and forges were making wrought and cast iron in several parts of Massachusetts—in fact, that work began as early as 1646. Trip hammers were in use after 1720. The tools of carpenters and shipwrights were forged. In the year 1748 500 muskets were made in Massachusetts. Those muskets were deposited in Castle Garden, in Boston Harbor, and were carried away by the British when they evacuated Boston at the time of the Revolution. The first tacks were made from iron about 1775, by a machine invented by Mr. Reed; and in 1807 the first machine was constructed which made the head upon tacks by one operation. In 1790 Perkins invented the nail machine for making heads on nails at one operation.

Shovels, spades, bells and cannon balls were made at that time. Sheet iron for tinware and for plates was also made at that time—an industry that is now being renewed in this country was started in colonial times. It had not any very great success then. It lasted but a short time. So far in this country the success at the present has been about equal to what it was then.

At one time pig iron and iron in blooms were exported to England. At one time England paid a duty upon American iron. Iron was imported there to such an extent (2000 or 3000 tons in a year) that the iron masters of England complained of it, and got a bill through Parliament imposing a duty upon all American iron exported to England.

Afterward the Londoners complained that the price of iron had been advanced in consequence of the duty, and they got a bill through Parliament exempting London and ten miles around from the effects of the duty. The Englishmen complained of the cheap labor of America, and that was one reason given why they wanted a tariff on iron. But that reason was not the true one. The true reason was in their own selfishness. Labor in America was much higher then than in England, as it is now; and the price of labor in America has kept in about the same proportion with English labor ever since.

It is interesting to go back to those times and see under what disadvantages Hardware was made. There were very few machines, very few trip hammers, and almost all the Hardware was made by blacksmiths in their shops.

To come down to a rather later day, in 1790, we find that Hardware was first made in New Britain, Conn., in a blacksmith shop. Sleigh bells were made then with a hole cut through the side of the bell to put the jingler in. They did not know how to cast a sleigh bell with the jingler inside. They were making them in that way in New Britain, when a man came along there and for the sum of $25 told them how to cast them with the jingler inside—that is, he told them to put it into the core and cast the bell around the core, with the jingler in the core, and then rattle the core out. I speak of that to show you how primitive manufactures were at that time. In the year 1820 there was some small addition. I think that some time in that winter the first furnace was built in Connecticut for casting iron. The furnace was the common blacksmith forge, dished out in order to hold iron, and the iron was melted with charcoal, and blasted by blacksmith's bellows. Two bellows were made to work alternately side by side, and in that way they were able to melt about 300 pounds of iron in a day, or at a heat. The iron used was entirely scrap iron. There was no way of getting iron from any long distance.

The article of screws is an interesting one to look back upon. Although they were made by hand as long ago as in the fifteenth and sixteenth centuries, they had always continued to be made by hand. The wire was drawn, cut off, headed by a hammer and the screw thread was made by filing around the iron with a three-cornered or sharp-edged file. It was in 1790, or thereabouts, that the first machine was made which would cut threads on screws.

To compare the ancient hardware manufactures with the present makes the present seem marvelous. The progress of manufactures in the New England States was in proportion to the demands of the country. The progress was slow, because the people were poor and the demands were slight. But as the demand increased and as wealth increased, manufactures increased. The manufacturers of New England had more ingenuity than the manufacturers of the old countries; and they were more prompt in inventing, making and applying new machinery. Labor in this country was more productive. We made more Hardware to the man, and we made it as cheap.

It is exceedingly interesting to go back to some of the methods of making what was known as common Hardware. I have in mind, for instance, the making of cards. They were formerly made entirely by hand. First the leathers were cut out, then the teeth were made by hand at first, and afterward a machine was invented for cutting the teeth, and then they were set in the leather by hand. About the time of the Revolutionary War, and prior to that, the cards which were used in wool carding machines were made by hand, and the teeth were all put in by hand. In 1790 a machine was invented by Whittemore of Cambridge, Mass., which revolutionized that trade. The cards were made after that entirely on those machines.

The growth of the manufacture of Hardware in this country has been a marvel, and greater in this country than anywhere else. [Applause.] We have taken any article manufactured in England, or in any foreign country, and have improved upon it, increased its production, cheapened its price, and have sent it all over the world. I need not say anything about the amount of Hardware manufactured at the present time, for it is beyond anything that was dreamed of a century ago. Hardware of every description is made here better and cheaper than anywhere else, and the demand for goods in this country is larger than anywhere else in the world. Our labor is more skillful. We have brought into this country, as well as had born into this country, the highest grade of workmen and mechanics. We have now in this country a working mechanical population exceeding that of any country in the world. We produce more Hardware, more merchandise, per man, twice or three times over, than any other country in the world. There is nothing that we do not make, so far as the labor is concerned, as cheaply in this country as it is made anywhere else. There is scarcely anything that we manufacture that we are not able to export to all parts of the world. [Applause.] On going into any part of the civilized world we are sure to find American Hardware. We find everywhere American edge tools of all kinds; carpenters' tools of all kinds, agricultural tools of all kinds. Such machines go from this country into all parts of the world, and take the preference. We send our scythes, our axes and our shovels to foreign countries, where nothing else will answer. We invented a scythe about the year 1770—that is, the scythe that is now used, the scythe with a back to it. Before that time the English scythe, as well as the American scythe, was made like an edge tool. This invention consisted in putting a back on to a thin blade of steel, like the present scythe. We manufacture to-day, and have for years, the best scythes in the world.

In agricultural tools and implements, at least, we take half the trade of the foreign countries outside of Europe, and in all kinds of edge tools we take half the trade of South America and of Asia. But, gentlemen, my time is more than gone, and I will bring my remarks to a close by saying that with the manufactures of this country in their present condition, with our machinery, with our unrivaled help, with our skilled mechanics, and with you, gentlemen of the Hardware and mercantile branches, there is no reason why we should not only hold our own in our own country, but take a large part of the trade of all the world. [Applause.]

The American manufacturer, with the American mechanic, has never seemed to realize his own strength, or the strength of his own trade. We have, as I have always said, the most skilled, the most willing, the most energetic and the most ambitious workers, workmen and mechanics anywhere to be found. Although our wages in this country—the earnings of men per day—are very much more than those of any other country, and especially of the countries on the Continent, who are our competitors, and although they earn so much more per day, still their labor to the manufacturer is cheaper than that of laborers in other countries. In other words, the labor cost of almost any article of American Hardware manufacture in less than the labor cost of the same article in any other country. The fear which so many of us have had of the pauper labor of England is a matter unworthy of consideration. The pauper labor of England, in the manufacture of Hardware, as compared with our labor, may be compared with the cheap farm labor of India, where that class of labor is paid 10 cents per day, as compared with our Western farm laborer, in the raising of wheat. With land as plenty and as cheap, with millions of acres which are not used in India, but that are roamed

over by wild beasts—with land in plenty, and with labor at 10 cents per day (cheap labor in the usual acceptance of the term), still in this country we can produce wheat more cheaply than they can in India, and yet we pay $1 per day for the labor. In other words, the 10 cent per day labor in India, under all the conditions that they have there, is not so cheap in the product obtained as is the $1 per day labor of our Western farmers. And so, if we will only take courage and go out before the world with our industries, with our machinery, with our intelligence and with our mercantile ability, we can conquer the world in industrial pursuits. [Applause.]

When I look upon this intelligent, this energetic, this ambitious company, it seems strange that any one should think that the industry and business ability of any other nation on the globe can compete with us in a free field and in a fair fight.

I have only to add that I know that you gentlemen of the Hardware trade, you manufacturers and merchants, will carefully consider the question that must come before you—of the greater freedom of trade; the question of placing ourselves with our raw materials on an equal footing with the manufacturers of England. Whenever we do that, we can certainly take care of ourselves in any quarter of the globe. [Applause.]

The Fourth Toast.

The Rev. James M. Buckley, D D., LL.D., was introduced by the chairman, and spoke as follows on the toast "Iron and Theology:"

Mr. Chairman and Gentlemen: A little girl went to church, and when she returned home she was asked what the text was. She said she could not quite remember it, but she thought it was Paul preached and had something about Apollinaris water in it. [Laughter.] A certain orator gives instructions to speakers to prepare their speeches on this plan, that one must suit the manner to the occasion, and stop. If you speak of flowers, you must speak in a light and airy way. If you speak of mountains, you must speak in a solemn and measured way. Now, to apply that principle to a speech on the iron trade, one ought to be very heavy indeed. But, assuming, perhaps, that that particular part of the work has been well done, I will turn to some other phase.

How could ex-Mayor Hewitt expect me to dispute him in arguing for sound money when the gospel that I preach has this in it: "Whose image and superscription is this?" "Render therefore unto Cæsar the things that are Cæsar's," and also this passage: "Provide things honest in the sight of all men." However combative I might wish to be, it would be wholly impossible for me to take issue with him on that point.

The last time I met Josh Billings it was on the hottest day in one of the hottest summers New York City had seen for 25 years, and I remarked to him, "It is very hot to-day." "You bet," said he, "I tried to get a man to bet odds with me on that, but couldn't find a taker." [Laughter.] Now, the fact is that I am glad my theme is not iron in politics. If it was, I should have to go into a careful, statistical, argumentative and scientific discussion of the development of steel, and I am not sufficiently familiar with that phase of the subject to speak at any length on it.

Now, with respect to this matter of a dinner in the interest of the iron trade, I perceive that they can hardly be expected to be as familiar with the Scriptures as a person who has made it a study for 40 odd years. Why did they not select that most magnificent text that suits this dinner and contains the essence of millions of sermons: "As iron sharpeneth iron, so doth a man the countenance of his friend." Why didn't they put that up here in letters of gold? The fact is, if you want to get the most perfect sentiment for any occasion you have got to go to the Bible for it. I will defy any one to produce from Shakespeare or any other writer as magnificent passages for such purposes as can be produced from the Bible. There are a great many things that poets have said about this trade. The best I know is this: "Care drives a nail in a man's coffin, no doubt, but every laugh so merry draws one out." That is a part of my creed. But I could go back to the Bible and I could show you this: "A merry heart doeth good like medicine, but a wounded spirit who can bear?"

Now, as for Tubal Cain. They have to go back to the Bible for the first solid point. The distinguished ex Mayor traveled back to the Garden of Eden. Going so far back as that reminded me of a story I once heard of how a person can go too far. There was a Catholic priest who once had an argument with a man on the subject of purgatory, and he said "You better not oppose that doctrine; you might go further and fare worse." [Laughter.] Now, to resume at the Garden of Eden, where the ex-Mayor got. Tubal Cain's mother knew what she was about when she named him. The name means an instructor of every artificer in iron and brass. He was the first man that ever was heard of in the business. It is very fortunate that it is to Tubal Cain and not to Cain that you go back. Now, my distinguished friend, the ex-Mayor, undertook to caution me. Allow me to say to him that 38 years ago I was a clerk in one of the largest Hardware establishments then in the United States. I understand the trade, and the last man to be deceived by a transaction in this line is your unworthy servant. [Applause.]

The fact is, advice requires a knowledge of the patient. In some trades I might have needed the prescription, but not with respect to the Hardware trade. It is true that the firm with which I was a clerk suspended business soon after my departure, but it is also the fact that I did not go to Canada; therefore, I don't suppose there is any connection between the two.

With regard to iron in theology, you cannot expect me to undertake to hammer a system of theology into you. You cannot expect me to undertake that. It would augur no good if I were to attempt to rivet your attention by quotations from the Bible. I will begin, however, in the line of modern science. What is a man who hasn't any iron in his blood? Why, his blood has no color without iron. You go into a drug store and ask what the most remarkable element in the greatest number of patent medicines is, and they will tell you it is iron. They will name to you no less than 56 well-known remedies in which iron is an important constituent. Now, some people don't understand the relation of things. A young fellow in England went to the medicinal springs on the Continent for his health. One day a friend proposed to him to take a walk. "Yes, after I take my medicine I will go with you." He took his medicine, and then he made a strange, mysterious noise, at which his friend said, "What does that mean? What is the matter?" The young man replied, "Why, this is for my health. The doctor told me to take wine, and iron, and bark three times a day. [Laughter.]

Now, with respect to iron and theology. A man who has no iron in his blood is a slave of public opinion. He never molds it. He is fit for nothing. He belongs to that class of men who are total abstinence men when they are talking with prohibitionists, and who believe in avoiding that fanatical subject when they are talking with wholesalers and retailers of liquor; they are ready to sympathize with Dr. Briggs, and at the same time they maintain that Dr. Green is the most perfect master of Biblical lore in the world. [Laughter and applause.]

Unless a man has iron in his blood he cannot be a moral man. He cannot deserve the compliment by your Chairman to ex-Mayor Hewitt - which, after watching him for 45 years, more or less, I believe to be most justly his due—of being true to his convictions. It takes iron in the blood for a man to be true to his convictions. It was that which caused Cromwell to be called Ironsides, and his men were likewise known as Cromwell's Ironsides. He says in his own letter: "They are men of religion that put some conscience into the things that they do;" and a year before he died he said they had never been beaten in any conflict in which they were involved. It was that noble regiment of Cromwell's men that won victory from defeat.

It was that which gave to the mild and honest Quakers their power—iron in the blood. It was iron in the blood that made the Puritans ready to fight the Indians—and to fight everybody else that stood in their way. It was iron in the blood that made Roger Williams able to go out into the world and establish a tremendous religious denomination. That is what the iron in his blood enabled him to do. Without iron, no creed will stand, and no religion will stand! It was the iron in his blood that enabled John Wesley to make his grand stand for religious liberty. And the Roman Catholic Church derives its power from its iron. The Russo-Greek Church—the strongest organization on the globe to-day of a religious nature—derives all its great strength from iron.

You see what a lot of good iron has done. Observe, all the wars arose from the fact that religion was united with the church on that subject. There has never been a solitary exception. It was not against the State so much as it was against the religion joined with the State that has caused all the wars on the subject. Thank God, we live in a country where there is no union of Church and State, and therefore there is no iron, in an evil sense, in our conflicts with each other upon that subject.

Now, then, as the colored preacher said, "Prepare for to get ready to close." [Laughter]. The most magnificent description of iron is given in the Bible, and it is drawn in such a true portraiture that even Gibbon, who did not believe in the Bible, declared that the image was perfect There were images of gold and brass and clay in the old Roman times that represented the different kingdoms. The last was the Roman Empire. It was as strong as iron, because iron subdueth all things. But the image had iron in one part of the toes and clay in the other. Therefore it was partly strong and partly weak. That is the best description of the Roman Empire, and it is the description of many institutions, political and religious; instead of being of solid iron, they are part iron and part clay. In olden times they used to substitute gold for religion. Now, the only thing in the nature of a sermon that I have to suggest is this, that a great many men nowadays appear to be trying to substitute iron for religion. One of the greatest iron manufacturers said to his pastor: "If you want good praying and exhorting, and good pulpit work for religion, the best way for you to get it is to call on brother Jones, who is my bookkeeper; but if you want any cash, call on me." [Laughter.]

Now, in point of fact, you cannot get any religion by substituting iron for gold. Religion makes use of iron and gold. Religion has made use of iron to carry Christian missionaries in iron steamships and over iron rails into every part of the

world, and it makes use of gold to send them there.

Gentlemen, you are engaged in a solid and substantial business. You are at the bottom of everything. Among other things, the church rests upon you, and you have this profound satisfaction, that whatever happens or whatever does not happen, everything good in the world rests at last upon the potentiality of iron, in one form or another, to carry it forward. The American Bible Society and the British Bible Society together have printed more bibles in the last 70 years than were printed in the history of the entire world before that time, and they could not have done it without the use of iron, for they have been printed upon presses made of iron.

I have seen the iron telegraph in the deserts of Sahara, stalking like a conquering hero upon the hills and down into the valleys of Khartoom, where Gordon met his fate.

You do not need any minister to aggrandize the magnificence of your business. Conduct it squarely and honestly and the American people, from the tack in their shoe to the iron in their hats, will stand by you. I mention this simile, for the last invention in Paris is a hat modeled upon the famous iron crown of Lombardy, which has in it a circle supposed to have been made out of a nail of the cross—I have some doubt about that myself—but the last hat is modeled upon that crown, and has a circle of iron in it. I say, then, from the tacks in their shoes to the iron in their hats, the American people say, "Give us a good thing, and all the trades and all the professions will unite in invoking a blessing upon the Hardware business and kindred trades." [Applause.]

The Fifth Toast.

At the conclusion of the remarks of Dr. Buckley, the double quartette rendered "Margaret, Fair One," after which the chairman introduced William H. McElroy of the *Tribune*, who responded to the toast "Subjective Hardware,"

Mr. Chairman and Gentlemen of the Hardware Trade: As I have been sitting here to-night listening to the speeches, I have been overcome with the thought that the Hardware trade represented here to-night was the most shrinking flower of modesty that I have ever confronted. The chairman in his opening speech, if I understood him correctly, said that the angels had ascended and descended where so many Hardwaremen were, and when ex-Mayor Hewitt came to speak he uttered in substance and sentiment that all there was in modern civilization was primarily due to the iron trade. Nay more, one of the speakers, as I understood him, said that Dante and Milton were not "in it" with the esteemed and likewise honored Peter Cooper.

I do not know, but perhaps I agree with him. When the ex-Mayor was talking of the indigestible toast which was assigned to him, I thought of a story told of a commercial traveler who had a beefsteak set out before him somewhere out near Kankakee. After he had tried his knife on it he called the landlord and said to him: "Do you know you are liable to be arrested?" "Why," said the landlord. "Because," said the commercial traveler, "I tell you this is an infringement upon the Goodyear patent." [Laughter.]

Dr. Buckley, I find out, was a Hardware merchant's graduate. In the language of that book by which he sets great store, he has forgotten the things which are behind and has pressed forward. He says you cannot get as good a quotation from any other book as from the Bible. Nevertheless it seems to me that the other night at a medical dinner a man got a fairly good quotation from "Gray's Elegy," which it would be pretty hard to match. He was a homeopath, and he was at a dinner of the regular school physicians, and in the course of the address of one of the speakers, turned to this homeopathic brother and said: "Why do you stay in the paths of this new-fangled school of medicine? Why don't you come out into the old paths? That is the path of glory." The homeopathist arose, and in a high falsetto voice said: "Sir, it seems to me that I have read somewhere that the path of glory leads but to the grave." And so by easy stages we reach "Subjective Hardware."

When my friend Mr. Williams and I agreed the other day that I should speak to this toast, I think we both forgot one important fact, and that is, that it is a good deal easier to write down a speech and find a subject for it than it is to write down a subject and find a speech for it. However, I have got a good story of subjective Hardware, which was told of no less distinguished a personage than the great Napoleon, and somehow or another it has escaped all his biographers. This is the story: One day at St. Helena, Napoleon stood gazing far out over the sea with a look in his eye which told he was thinking of that colossal game which he had played with all Europe for a chessboard and with armies for the pieces. One of his attendants said to him, "Sire, what is it you are thinking of?" And Napoleon turned to him with a grim smile on his face and said he was thinking that "if all the iron which has entered my soul could be made objective, could take on a concrete shape, I would have enough material at my command to start the biggest Hardware store in Europe." [Laughter.]

Now, there was another story which comes in very aptly just here. It was a story which we used to be fond of in college. There is an old legend which says that the goddess married Vulcan, and one very fresh sophomore suggested one day, by reason of her beautiful soft eyes, which had all the facination of the eyes of a Roman ox, on account of which she was called in some of the old Greek plays, the "ox-eyed one," "inasmuch as she married Vulcan," said he, "Why not speak of her as the oxide of iron?"

Now, gentlemen, I venture to add this one to that. It seems to me that you men here will make the best use of this dinner if you turn away for the time being from the concrete Hardware and fix your thoughts on something else. If necessary, fix your thoughts on subjective Hardware, or upon Hardware of the fancy and imagination—what might be called the Hardware that never was on sea or on land. The trouble nowadays is that we live too fast. We are continually trying to see how we can accumulate the greatest quantity of money in the shortest space of time, and there is great danger that we shall forget that Hardware is a means and not an end, and so we shall lose sight of those things which really make life worth living, which give it sweetness and light and variety, and which give us a gayety which lasts us all along, even down to the days of our death.

The other day I was over in Boston, and a friend of mine told me a story of a hustler. My friend has a splendid picture of the Roman Forum hanging in his office, and one day this hustler came in to see him on business, and noticing the picture, said "What is that?" My friend said "That is the Roman Forum." "Is it standing yet?" said the hustler. "Why, yes," said my friend, his eyes glowing as he looked at the picture, "it has stood there for centuries." And my friend said that the hustler simply remarked in a dry, matter of fact way, "Well, it seems to me that Rome is a very unenterprising city." I tell you that when a man comes to take that view of things, it is high time that he went out of business and into an asylum for incurable idiots.

Now, one word more. I congratulate you upon this dinner for three reasons. In the first place, the fact that you are here after an absence of 30 years is a pretty good indication, considering how good the dinner is, that the Hardware business is going on prospering and to prosper. I don't know what the dinner was in 1860. We will kindly draw a veil over it, but when I think there must have been something or other served that came in long black bottles so deadly in effect that it took the average Hardwareman 30 years to recover from it, I say, with my friend Mr. Haines, it is high time we had a prohibition amendment in this State. [Laughter.]

I congratulate you, in the second place, because you have had that iron. It is commonly spoken of as one of the baser metals. Now, that is a lie. Gold and silver, all history teaches, have been responsible for nine-tenths of all the baseness there is in this world, and to-day in Congress it is not iron, but one of the precious metals, that is breaking up happy homes.

I congratulate you, in the third place, because a Hardware store prefigures the millenium. This may not appear to you at first blush, but going into a well-developed store and seeing what is displayed there, one unconsciously recalls the old prefigure of the millenium when the spears shall be beaten into pruning hooks and swords into plow shares, and a nation shall war with Chili no more.

At the conclusion of Mr. McElroy's remarks the quartette rendered "Star Spangled Banner."

The Sixth Toast.

Governor Goodell then responded as follows to the toast, "The Future of Manufacture:"

Gentlemen of the Hardware trade: I am asked to speak of the future of manufacture. That is a broad subject, because it relates not only to the manufacture of Hardware and connected trades, but also to all other kinds of manufacture. The future is something which no man can devine. The past is something which has passed into history, and if we acquaint ourselves with history we can then easily suggest the results of the past.

We have been told this evening truthfully that we made a year or two ago more than 10,000,000 of tons of pig iron in this country. That is an enormous amount. Just let us remember that it means 27,000 tons a day. It means that we are making in every minute a carload of pig iron. Now, are we to continue and keep up this enormous production? Is it possible for this country to consume such a quantity? Or, are we in the near future to find such a revulsion in this line of business that many of our furnaces will be obliged to go out of blast? It is a question too large for me, and I think possibly too large for you to decide. Yet I have great confidence in the future, and in studying the future we must study the past. Why, only a few years ago our bridges were made of wood with a few iron bolts, and now they are made almost entirely of iron. A few years ago our fences were made of wood and stone. Now the barb wire business has become one of the largest industries in this country. Barb wire fences are seen everywhere. We are constantly devising and discovering new uses for iron and steel. Last night as I was on a railroad train, a fellow passenger remarked: "What will the railroads do soon for ties on which to lay their rails?" Then I remembered a few days previously I had

heard that already steel ties had been put into use. Very soon the railroads will be using them all over this country, and you can appreciate what a vast amount of steel will be consumed in that way.

When I remember that invention is going on all the time; when I realize that only a few years ago a hall like this would be lighted with whale oil, and then a little later with gas, and now with this beautiful electric light, I think what remarkable strides invention has made in the past few years. You tell me that we are living in a generation the like of which has never been known, and I tell you we are living in a generation the like of which never will be known again. I believe we have just begun to discover great things.

Now, we have been told by Dr. Buckley this evening about using iron in the blood. My friend here at my right and myself are strong prohibitionists, and we believe the day is speedily coming when prohibition is to prevail throughout the land, and then the people will accustom themselves to look upon these things simply as medicine, for the iron in them.

We can hardly conceive of the various things that will be in use in the near future. I am told that Mr. Edison is just now encircling an iron mountain with wires, and he thinks that in a few years—perhaps in a few months, so as to have it ready for the World's Fair at Chicago—that he will be able to listen to the voices of the sun and the other heavenly planets by means of that wonderful magnet. I am afraid I shall never enjoy listening to the rumbling of that distant luminary—and, too, I am afraid the great Creator will come down and destroy the world before that time, as he did long ago when the people attempted to build the Tower of Babel. But we can scarcely imagine what the future has in store for us.

Now, the future of manufacture, as regards the profit in it—how are we to make money in the future? Prices are falling every day. Why, a few years ago the price of steel was three times as high as it is to-day. It has been constantly decreasing in price, and we are continually being told that the price is so low and the profits so small, in the manufacture of this, that and the other product, that we will be obliged to give up the business soon.

I tell you, my friends, we old fellows will be obliged to give up business—those of us who have got into the habit of working only on certain lines, and believing that because we were successful 20 or 30 years ago in a certain line, and by doing things in a certain way, that we must follow on in that old fashion. We will go to the wall, and the younger men, who keep their eyes open, and are wide-awake to the responsibilities of the position and who understand the situation, will walk in and take the business. They will discover some new ways of doing the business, and they will be able to do it so much less than we have that they will make all the money. [Applause.]

The times are propitious. We are on the eve of the greatest prosperity, it strikes me, that this country has ever seen. The steel and the iron interests are in the very front rank. Why, I was told the other day by the private secretary of Mr. Carnegie that if the tariff was allowed to remain as it is now on tin plate within two years 500,000 or 600,000 tons of steel would be used for that purpose alone.

I believe it is your business and my business as business men to demand that this everlasting tinkering with the tariff shall cease. It is our duty to try upon the present conditions for a little time to see whether they are right or wrong. Then, if we find that the tariff is wrong, let us do away with it. But, in the meantime, let us go on and learn, as we must learn, for necessity is the mother of invention, and if we are prosperous every day of the year and every year, we shall never invent anything. Let us learn. If we find prices are so low that we cannot compete with them, because necessity has compelled some one to invent some new method of doing that business, why, let us adopt it too. Gentlemen, I thank you for your patience and attention. [Applause.]

The Seventh Toast.

Mr. Plumb then responded to the toast, "The Ethics of Trade," which was accompanied by the sentiment, "I did it with my little hatchet.—G. W.," in the following terms:

Mr. Chairman and Gentlemen: It affords me great pleasure to be here this evening as a representative from the State of Pennsylvania. It is true I am a native of the great Empire State and naturally interested in its growth and development, but what little reputation I have has been acquired in the City of Brotherly Love, and I am therefore proud to be known as one of its adopted sons.

The toast has the sentiment, "I did it with my little hatchet." Now, I wish to disabuse your minds of that, for what reputation I have acquired in this world has not been done by cutting prices [applause], but by hammering constantly at the jobbers' doors and maintaining the highest market quotations.

Now, the subject assigned to me is so broad in its character and general scope and so far-reaching in its conclusions that were I to go into an attempt to deliver a speech covering the entire question I would not only tire you with my remarks, but take up the time of much abler speakers. The most of us in our hurry after money-making are apt to overlook the duty we owe to others. This is especially the case if we are brought into competition with strong, active competitors. But after we come to know them and take them by the hand and greet them and learn their good qualities they often prove our best friends.

The average business man, in the hurry of business and the securing of wealth, not only devotes the usual hours for business, but he is apt to carry his troubles home with him at night, and commune with them while he takes his dinner; and he lays his plans for the next day while his family sit quietly by wrapped in silence, afraid of disturbing him. I think the majority of business men are guilty of this charge, and I believe we owe a duty to our wives and children, as well as to our business, and that we should devote a few hours of each day to their entertainment and enjoyment. If we do that, we not only conduce to their happiness, but enhance our pleasure as well, and also prolong our lives.

While the city of Philadelphia has retired gracefully to third place, she enjoys one institution that her two great rivals have not, and that is a Hardware Merchants' and Manufacturers' Association. This organization was formed at the residence of one of our leading business men, who is probably known to a great many of you—Samuel Disston—on February 8, 1886. We started with a few people, but we have gradually extended our influence until now we cover every merchant and manufacturer in the Hardware trade. I hope the gentlemen here to-night will undertake to form an organization of a like character in this city. A great city like New York could not only extend its influence among the merchants here, but the influence of such an organization would be felt over the entire country.

Before I close I would like to make a remark in reference to Philadelphia. When it comes to a question of patriotism or charity there is no city on the face of the globe that is as prompt to come to the front in this respect as is Philadelphia. [Applause.] Only yesterday the steamship Indiana sailed from our port with $100,000 worth of provisions for the starving Russians, every dollar of which was contributed by Philadelphians. [Applause.] This steamer was not only built in an American shipyard, but she was manned by American sailors and commanded by an American officer; and, what is more, she belongs to the only steamship line that carries the American flag. [Applause.]

The Eighth Toast.

The chairman then introduced William H. Williams to respond to the toast: "Pins and Needles." After felicitous remarks in which many happy hits were made, which were greatly appreciated by the company, Mr. Williams said:

It occurs to me that possibly the toast might have been assigned to me with a view of citing a sentiment like this: *The friendship of business.* If that was not their purpose, I can think of no excuse for this quotation; for, if I remember rightly, it was the subject of friends to whom Hamlet was referring when he said: "Grapple them to thy soul with hooks of steel."

You need not be reminded by me of the friendships which have been formed in associations with gentlemen connected with the Hardware trade. You know, of course, the story that has been circulated freely this evening, that as this was the fourth dinner of the society, and they occur every 30 years, and our chairman was at the first one, that the friendships which have been formed in the breasts of our amiable presiding officer are those that might well tempt him to exclaim: "Grapple them to thy soul with hooks of steel." Surely, if we look about us and consider all the afflictions and annoyances that stick pins and needles into our souls, we may well regard with favor any gathering, any circumstances that shall bring us together as friends and as neighbors and shall cause us for a few moments to look about and reflect upon the friendships we have all made in the ordinary pursuits of business.

Friendship is partly a matter of sentiment. It is often founded entirely upon the knowledge of and confidence in human character. I should like to know if there is any place in life where men are more apt to have that knowledge of and confidence in human character than can be found in an association with people of whom and through whom they earn their daily bread. We go on for years selling Hardware, making Hardware, trying to sell it, coming in contact with the buyers of the country, merely as a matter of business, of bargain and of sale; but gradually in the course of time we find that the men whom we looked upon a few years ago as strangers, as people who were after only the almighty dollar, have certain amiabilities that draw them toward us. There is scarcely a man in this room, not even the youngest, but will admit that some of the most valuable friendships formed in life are those begun in this way.

Is it not then desirable for us to cultivate those amenities and friendships in business which tend to lift us above the mere sordid relation, which tends to carry us for a time at least into that realm which is not entirely sordid, and brings us into contact with the qualities that we most love among the friends we have outside of business. To this end I know of no more desirable feature than a gathering like this. I think we all regret that we have permitted so many years to pass without coming together in this pleasant way. I think there will be an echo in every heart that we should meet here frequently,

at least once a year, and endeavor to bring in our friends from other places.

And in this connection, a fact suggested to me to-night is pertinent: that among those here gathered there is abundant material for the formation of a Hardware club in New York City. In no association that any of us form outside of our daily walk in life do we find better material, more genial, manly, refined material, for the cultivation of business friendships than we have in our own noble Hardware trade; and I think if you men were to get together as soon as practicable after this dinner and resolve to form an organization down town, where you could meet once a day and have your lunch—resolve in the first place that you will have a lunch, and then that you will get together like sensible men and have it in a decent, respectable manner. [Laughter.] Have a room where you can invite your customers from out of town; you could make as great a success of it as has been made by the Merchants' Club, the Insurance Club, or any other similar organization in New York or in Philadelphia.

Therefore, in closing, I would simply give you this sentiment: That we cultivate the friendships that we have at hand, remembering always that,

There is a power to make each hour as sweet
as Heaven designed it,
Nor need we roam to bring it home, though
few there be who find it;
We seek too high for things close by, and lose
what nature found us;
For earth has ne'er a charm so dear, as home
and friends around us. [Applause.]

The Ninth Toast.

The quartette then sang "Auld Lang Syne," when the toast "Our Commercial Organizations" was responded to by F. B. Thurber, who after some pleasant introductory remarks, which were much enjoyed by the company, said:

Gentlemen, I believe that in the spirit of this country we find something that the Hardware trade may emulate. Among all of the great trades of the country, organization has progressed less in the Hardware trade than in any other. I believe the nucleus is here to-night of forming an organization which in itself can have a great influence upon the affairs of the country, and it ought not to pass.

One reason why organization has not progressed in New York as fast as it has in other places is because New York is so large. One day the late William B. Travers met a Baltimore friend in Wall street, and there was some interruption to the conversation by Mr. Travers stuttering, which you know he was celebrated for, and his Baltimore friend said, "Why, Bill, I believe you stutter worse than you did in Baltimore." "B—b—bigger town." [Laughter.]

Now, if we had not had as good journals in the Hardware trade as we have, we might perhaps have organization more quickly. The trade journals of this country have grown into a power. In this specialist and organization age they have been the medium of communication in the commercial thought and they have to some extent obviated the absolute necessity for organization. They have performed another function, which perhaps the manufacturers do not fully appreciate. The most meritorous invention cannot attain a market to would-be consumers unless they let those consumers know the merits of their wares. Now, that is a function of the trade journals of this country, which they have performed, and which very few men appreciate. I know it in my own line of business.

I have gotten a little glimpse of it from the association I have had with the Hardware line. No industry can flourish without the trade journals, who constitute the voice of any industry. Look at the age that we live in. It is an age of organization, and if we were to realize Tennyson's dream of the federation of the world it would be through commerce. See what the organization of commerce has done. See the locomotives merging the fertile furrow of the prairie farms in the closing furrow of the sea. See the great ferry boats passing backward and forward across the ocean with the regularity of shuttles in the loom. And, Mr. Chairman, did you ever realize how the model of an ocean steamship resembles the shuttle? It is binding the nations together as it weaves backward and forward in bonds of common interests.

And, gentlemen, I say to you here to-night, organize. We have it from the National Board of Trade down through all the various graduations to the trade organizations, and the trade organizations are the foundations on which everything rests. If this Hardware trade does not form some sort of a Hardware association or club there will be a miscarriage of opportunity.

The Eleventh Toast.

In introducing Samuel A. Haines, who spoke to the toast, "Our Commercial Travelers," Mr. Walkley referred to the important part taken by commercial travelers in the business of the country. Mr. Haines said:

Mr. Chairman and Fellow Commercial Travelers: I take it for granted you are all either now or have been commercial travelers. A man's education is not complete until he has been one; and I want to say in the beginning that we are a very large number. The commercial travelers of this country are to-day, numerically speaking, over 300,000 without a doubt. I think, too, we compare favorably with a like number in any other class or calling that can be found on the face of the earth. [Applause.] I am quite sure that if that body of men who do the commercial traveling of this country could be gathered in one mass, their heads would measure more in circumference than that of any other class of men in the world.

We are a very remote class. Some of you may not realize how remote we are. We are older than the manufacturer, we are older than the merchant, so far as the record goes. In fact, the first record I can find of commercial travelers is 1729 B. C. You have all read your bibles, and have read of Jacob. He had a large family, and one of his boys was named Joseph, and his brethren did not like him. Why? Because he was smarter and brighter than the others, and they wanted to get rid of him. They conceived ways of doing this, and thought to kill him, but seeing no profit in that they sat down to eat and consult, and while doing so a party of commercial travelers, Ismaelites, were seen to approach, coming from Gilead on the way to Egypt.

They traveled not in Pullman cars, as we do now, but by the camel road, a little slow, and a little heavy, perhaps. But the brethren conceived the idea of selling Joseph to these Ishmaelites. The commercial travelers were ready for a trade then and they are now; and these brethren sold Joseph into Egypt. They bore no Hardware, but spices, balms, myrrh, &c., and if you have ever met any of them in your journeyings you will realize that they did not need Hardware so much as they did balms and spices, or something of that kind. [Laughter.]

But this I refer to to call your attention to the fact that commercial travelers, at this early date, had a marked effect on the world's history. We know that commercial travelers have always affected the history of every nation, and I want to jump from that date down to the time when England began to assume her supremacy, and you will find that it was the commercial travelers that gave her her prestige, that gave her her proud name, that enables her to know that to-day not a minute of time exists that the sun is not shining upon some of her domains. And this is owing to the commercial traveler. Her policy was in the early days to send out commercial men with goods to sell into the far-away countries, with goods such as cotton, manufactured articles, tools, fire arms, and rum. I add rum to the fire arms; the two ingredients go well together. And you will notice, if you follow out England's history, that when the rum and the fire arms got to working—and it is the same there as here, there is no difference in the effect—they had to send out armies in order to control the people with whom they were trading and to protect their commercial travelers, and when the armies got through protecting them, they found that a little expensive, and then what does England do but to annex those various countries to make part of her own; and thus she has become one of the foremost countries in the world, in a commercial sense.

Her greatness primarily was due to the commercial men. And in a similar way perhaps this country is seeking to enlarge our domains. We may be using the Government itself to do this. But we seek, of course, to make capital in the Southern country, by drumming a trade in South America, and we have the assistance of our worthy Secretary of State in doing this. [Applause.] And we are using the consuls that are at the various ports. This country on the north of us, into which many of you as commercial men have wandered, is quite interested in our manufacturing and our industries; and it is only a question of time, in my opinion, when, because of the work done by the commercial traveler of America, when it shall be said that there shall be only one flag and one government for the continent of both North and South America. [Applause.]

In the toast given me to respond to I notice that it is said that the commercial traveler was remote, unfriended.

He was at one time unfriended. Well, he did have a bad name at one time and I remember it well. He did not deserve the friends he has got to-day. And to draw your attention to the fact of the relation he held to the community 25 or 30 years ago and to-day, I want to tell you of an experience in the year when Andrew Johnson swung around the circle. You older commercial men will remember it.

I was in Toledo the same day he was, and Toledo was very much exercised. He was going to Detroit in the evening, and this was in the afternoon. It was one of those lazy afternoons, when every one felt like sleeping, and in the coach was a lady from a city in Massachusetts going to Detroit to visit her daughter. She had a tongue in her head, as many ladies have, and the commercial men were rather chaffing her on the Andrew Johnson question. Well, after a while we all went to sleep and we got up near the Grand Trunk Junction (those of you who have been there will know the place I mean), and we must have run over one of those peculiar animals that are noted by their pungent flavor, and ever one put up their handkerchiefs and dropped the windows to protect themselves.

This old lady was sitting with her hands over her stomach and woke up looking very much astonished. She sniffed a little, taking in the flavor, and then said: "Good gracious, what have we done? Have we run over one of those nasty drummers?" [Laughter.]

And that was very much the condition at that time, but we have changed. The commercial traveler of to-day is a very different article from what he was 30 years ago. He has got to be. He has got to look out for himself, because if he does not he will not long be a commercial traveler.

I have seen a commercial traveler drunk, and you have, too. There was one here in a New York car a few months ago. A commercial traveler, though, has got to be a gentleman; if he is not he will soon be banished from the road. Well, this commercial traveler in this car had a seat. And you will find him generally polite and ready to give up his seat to a lady. He saw a lady enter, and he prepared for the struggle of getting up from his seat. There were two other men standing as he struggled out of the seat and tried to make a bow to the lady, and one of the men sat in the seat, and this was the address he made to him: "Say—hic—I am intoxicated. I know it—hic—but I will get over it. You are a hog, and you never will get over it." [Laughter.]

So it is a man may perhaps once or twice be intoxicated, and he will get over it; but if he is born a hog he does not need to start out in commercial traveling, because he won't succeed. And success does not attend all. A man may be a success in almost every other line but yet fail as a commercial traveler. Dr. Buckley told you that he was once in the Hardware business. I know to-day one of the most brilliant ministers of this country who started out several years ago in this line. He made one trip and failed. He made a second trip at the solicitation of his father, who was the senior of the firm, and he made a worse failure than before. Well, his father sent him away to college, and to-day he is the pastor of one of the largest Congregational churches in this country. So I say, while a man may be successful as a parson, while he may be successful as a lawyer, or successful as a manufacturer, he may be an outrageous failure as a traveler.

The brightest and best men of to-day are commercial travelers of this nation. He is ever ready to help a friend, he stands with an open heart and an open purse; he is more often called upon to help others than any other class of men. It matters not what the distress, he is ready; if you call him in the night, or call him in the morning, or in the evening, he is always ready. He is like Pat in the creek. An Irishman came along and said he wanted him to help Pat out of the creek. "How deep is he," said he. "Up to his ankles," was the reply. "Then tell him to walk out." "But he is up to his ankles head first." And so he was willing to help him out.

My toast says he is melancholy. Yes, and why not? He leads two lives for a time; one for the street, road, shop, world, and the other for his home. Whatsoever a man is in his home that is what the man really is, says an eminent writer.

No class of men on earth stand higher so far as ability and character go, no class of men, I mean, than the commercial traveler. I don't care if you run a distillery or a brewery, you still want to send out a man that keeps sober; that keeps his head on him, whatever your business may be. I know how it is. Merchants and manufacturers are waiting to secure the customers, and they don't ask any questions how they are secured. The traveler treats his customer to secure his trade, and it goes on, and in about 10 or 15 or 25 years the people say, "Poor devil, he ought to know better."

And I want to tell you to-night that the commercial travelers in this country in organized associations have set an example to all organizations of the country, merchants and manufacturers as well, where at a splendid banquet 408 sat down in the City of Minneapolis in 1888, and no wine [applause], one large commercial association of the United Commercial Travelers, whose basic principles are Unity, Charity and Temperance. And there is a banquet being held every month in the year, but never is there wine.

There is a little proverb over in Paris "*Horas non numero visi serenas*"—I count only the sunny hours. And the commercial traveler can afford to count none but sunny hours. His life must be made sunny if he would win. Never mind how melancholy comes over him; never mind how dull trade is. He can never go and present his card to a man with that melancholy in his face, or bearing the preceding day's failures in his countenance. He must count only the sunny hours, and you say he is jolly. And thus has he gotten a name to which he was not properly entitled.

You say here "slow." That is in my toast. Never slow. If there is any one class of men who are the emblems of all industry it is the commercial traveler. His moto is everywhere "Get there," and he generally gets there. [Applause.] And if he does not get there you don't want him.

The next sentiment says "Traveling is no fool's errand." No. Dudes do not answer for commercial life. The standard, I am happy to say, is growing higher and higher every day. He has made up his mind, the commercial traveler has, that he does not need a stimulant to sell goods. He looks up and realizes that the topmost rounds of the ladder are many times vacant, and that the best stimulant for him is that of duty, that is proved continually in his calling.

I say the commercial traveling is building his character. I say the commerce of the world, not simply when they began with the Ishmaelite traveler from Gilead to Egypt, not simply England owes her supremacy in commercial life to the commercial traveler, but this United States is belting the world with the commercial traveler.

And you manufacturers would give them the utmost confidence, bind them to you closely heart and soul, to your interests, so that they may realize that there is a round near the top of the ladder, which by following out this line of duty they may occupy. The old Persian proverb has it that "the stone that is fit for the wall is never left in the highway."

I would like to talk to you on this subject for many hours, I could tell you so much. But it is late, I see, by looking at my watch, although a commercial traveler is not supposed to look at his watch when he has a duty to perform. I have no duty to perform, except to say that to every young commercial traveler my heart goes out in sincere sympathy and prayer. I know what it is to start away from home. I know what it is to be bereft of friends and feel melancholy and unfriended. But mark you, my friend, if you will stand by the right the right will stand by you.

These vacant places on the top rounds of the ladders of business success are not only vacant to-night, but there will always be vacant ones. You can occupy them if you will; and if you are in commercial life let your motto be that character, rather than money consideration, shall be the foremost that guides you, and keep before you that motto "Get there." You may not reach the hight you seek, but you may be worthy of it. [Applause.]

The Twelfth Toast.

In introducing William W. Supplee, the last speaker, the chairman referred to Philadelphia as a great distributing center of Hardware, and to Mr. Supplee as particularly qualified to speak on the "Distribution of Hardware." Mr. Supplee's remarks were as follows:

Mr. President and Gentlemen: Thrice did I beg to be excused from participating in the speaking upon this important occasion. My desire was to be present as an honored guest, listening to the oratory of the fluent speakers which I knew could be selected from the talent here assembled, and was quite surprised when I saw my name published in that valuable journal and distributor of Hardware information, *The Iron Age*. I then knew there was no escape, for information given editorially in that journal can always be relied upon.

"Thrice did Mark Antony offer Cæsar a kingly crown, which he did thrice refuse." Yet Cæsar was ambitious; but what was the talent that surrounded Cæsar compared with the ability that surrounds the speaker to-night?

Show me the successful manufacturer or merchant who is not ambitious. It may be with the manufacturer the quality or the large variety of his goods; it may be his extended trade, and it may be for the accumulation of wealth. Laudable ambition is commendable, selfish ambition is to be condemned.

Without that laudable ambition, the names of several Hardware manufacturers, whose business extends throughout the entire world, who now have their salesrooms and offices in this city, would scarcely be known to the present younger generation. Without that laudable ambition, the name of Henry Disston & Sons of Philadelphia would not be before 100,000 mechanics in this country.

The founder of this house began his business as an excellent mechanic, without means, local reputation or friends. The few saws he could make with his then slender means were delivered by himself after his day's work was done, and the reputation he gained was in supplying the trade against his then formidable competitors, Spear & Jackson.

Coming from the Quaker City, I feel that no pyrotechnical effort will be expected of a representative of that city. It would not be true to tradition if one were to attempt it. I feel, however, that some reference to that city may be excusable.

The changes that have taken place in the manner of doing business since the last banquet given by the Hardware trade of this city, in 1860, are alike creditable to the master minds who created them as they are convenient to those who at present enjoy their benefits.

My connection with the Hardware trade began just before the time of that banquet. If we go back 20 years before that date we will find the Hardware then manufactured in the United States consisted of screws, saws, a few door locks and other unimportant articles, but the percentage of all Hardware sold was then about 85 per cent. of foreign production.

It may not be inappropriate to mention an incident that occurred in trade about that date. A buyer accustomed to buying his goods in Philadelphia made a visit to this city before making his purchases. Falling into the hands of some progressive importer, he was given the price of Wostenholm pocket knives at so much to the pound sterling, the meaning of which the buyer knew about as much of as he did of the Greek language, and no more.

Coming to Philadelphia and entering a then representative house, where he had been accustomed to making his purchases, fully equipped with information from New York, the first article he priced was Wostenholm pocket cutlery. Said he: "I want to buy these by the pound." "By the pound?" said the seller. "Yes, by the pound." "Charlie," called out the man "bring me a pair of scales." Putting a bundle, containing a half

dozen two-blade, ordinary handle, leading number pocket knives upon the Scales, said he: "Well, this weighs 12 ounces to the half dozen. That would be 1½ pounds to the dozen, at $7.50 per dozen. That would be about $5 a pound; but you do not want to buy Pocket Cutlery by the pound. A Pearl Handle would cost you more money, but a common Iron Handle would cost you less by the pound, say about $4."

The man, looking upon a mysterious piece of paper, which he had pulled from his pocket, saw marked $10 to the pound. Said he: "Well, I came near being cheated. I will buy from you on the old plan, and you put my pocket knives in at the right prices."

About this time there was a man doing business in the upper portion of Philadelphia by the name of Silas Rush. Being desirous of increasing his business, he bought a lot of guns, and during his absence from the store a salesman sold a friend some of these guns. This friend had recently moved as far West as Ohio, and knowing he was quite responsible for all he purchased, he succeeded in making the sale. He was quite elated, and when Mr. Rush came in told him of the circumstances. "Why," said Rush, "we will not send those guns out to Ohio. The man will never pay for them in the world. When a man moves as far West as Ohio we never hear from him again."

There are now present representatives from large manufacturing establishments who penetrate our entire country, and send their products to all parts of the world, and the distribution of their products ends only at regions that are entirely uninhabited. There is no doubt of their ability to produce and successfully compete with the world, and at the present time, where the guns went into Ohio is now considered East and not West.

It may not be generally known to those here that such an every-day article as a screw auger is an American invention of a Thomas Garrett, residing in the suburbs of Philadelphia, where the descendants of his apprentices still remain and manufacture the ordinary black auger.

In the near vicinity the welding of cast steel into iron was first successfully introduced by Mr. Robert Beatty (a blacksmith), who manufactured hatchets, broad axes, &c. A man of great simplicity of manner and habits, who, instead of taking out a patent, taught all the neighboring blacksmiths and others who presented themselves.

It was related of him that some few years after the discovery, while making a broad axe, a stranger presented himself, and viewed the operation with much interest, and presently remarked: "Is that cast steel you are welding to iron?" "Yes," said Beatty. The stranger then drew out a document from his pocket and remarked, "I have a patent for that, and am selling the rights. My price is $200.

Said Beatty, "Why, that is my own invention, and I did it many years before the date of your patent." "I do not care for that," said the stranger, "I have a patent that Uncle Sam granted me, and I paid him money for the patent, but as long as you are the first inventor, I will let you have it for $50, but all others I shall charge $200."

Mr. Beatty paid the money, and, from our experience, we think possibly he was wise, as many of us know from experience how uncertain patents which are issued by Uncle Sam are. We pay our money, but in the end they frequently cost us $1000 to defend what we paid the United States Government $100 to protect.

Britannia spoons were first made in Connecticut, and were molded during the day and finished during the long wintry evening by scraping them with broken glass, the long scrapes upon them being distinctly visible. One can imagine the appearance of these, and draw comparisons between them and the finely finished modern product.

It would be quite interesting to trace the lock business as between the time this country imported the uncouth English locks and later the few crude wrought locks made in this country and those manufactured at the present time. Competition has reduced the ordinary cheap lock to $1.50 per dozen, but compare the former with the fine locks, with artistically and elaborately constructed bronze, oxidized silver or gold plated furniture, each piece of which is in itself a treasure.

Recently, entering the house of an acquaintance, and making comments on the front-door furniture, I learned that the front door and vestibule lock, with furniture, alone cost him about $500, and the gold-plated hinges alone cost him $45 a pair. I also learned of a friend of his, who paid for changes in patterns on locks, lock furniture and hinges $1000, and that the locks, with lock furniture and hinges, in that house cost him about $7000.

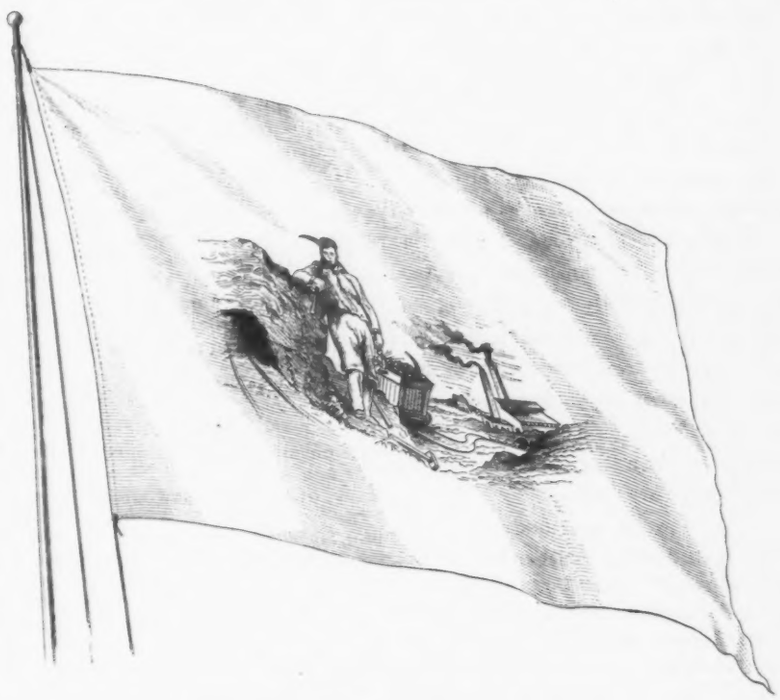
The increase in the volume of Hardware sold since 1860 would seem somewhat fabulous. The catalogues of the Western houses, Chicago and St. Louis, numbering from 1500 to 2000 pages, with the thousands of illustrations, would hardly give an idea of the volume of their trade, in which they include not only what we understand as Hardware, but in addition its collaterals, nails, tin plate, metal, guns, ammunition, mining tools, lathes, &c., and roll up their annual sales high into the millions. While we in Philadelphia, with Hardware alone, are content to make a creditable annual showing of between the $1,000,000 and $2,000,000 mark.

Of your business in New York, I have nothing but this to say: You manufacturers and merchants are fully aware of the value of the vast amount of Hardware you distribute, not only over the whole of this vast country, but also, as shown by the manifests of the vessels leaving your port, you distribute throughout the entire civilized world. Important as the annual production and sales of Hardware now are, we sincerely hope that at your next meeting some one may be able to report a handsome multiplication of the present amount.

The chairman then, in behalf of the Executive Committee and the Committee of Arrangements, thanked the company for their part in contributing to the enjoyment of the evening, alluded to the fact that the occasion had evidently been a pleasant one for all concerned in it. He then proposed a toast in memory of the departed—those who had died since the last dinner. This toast was drunk standing and in silence. The company then dispersed, congratulating one another on the enjoyable evening and the desirability of having another dinner next year.

The Old Hardware Flag.

The accompanying illustration of a flag will be of interest as recalling early recollections of the Hardware Board of Trade. This was their property, and was used in connection with the Hardware dinners held previous to the war. For the past 30 years or more, however, it has been doomed to seclusion, though well cared for and well preserved. The flag is 14 x 21 feet in size, made of white bunting. The miner, who is represented as having come from the mine with his lantern still in his hand, is 5½ feet in hight. The car of ore at his side and the factories in the distance complete the connection between the raw material and the finished product. The improvement made in the art of mining and in the construction of factories is forcibly shown by a comparison of what may be supposed to have been an exact representation of existing conditions 30 years or more ago and the present day. The old Hardware flag has many pleasant associations connected with its inception and subsequent use, and will continue to be held in veneration by the Hardware trade.



The Old Flag of Hardware Board of Trade.

1860-1892.

Representative Merchants.

THE TRADE will observe with exceptional interest and pleasure the group of portraits which are given on the accompanying sheet, and will recognize among them the faces of many well-known Hardwaremen. All the gentlemen whose portraits are thus given were connected with the trade in 1860, and were present at the Hardware dinner of that year, and are, moreover, still actively engaged in business. We give below a brief outline of the business career of each of these gentlemen, from which it will be seen that there is considerable diversity in the lines of trade with which they have been identified, and also in the length of their business experience, some of them at the time of the 1860 dinner being young in years and just beginning to learn the business, while others at that date had been connected with the trade from 20 to 30 years. There are thus in this group of representative merchants some who will be recognized as veterans in the trade, and others, younger men, who are actively filling responsible positions, bearing comparatively few marks of the years which have passed over them. The trade will unite in congratulations to these gentlemen, nearly all of whom were present at the dinner on Tuesday evening, on the record which they have had and the success they have attained.

W. H. BELCHER.

W. H. Belcher of Belcher Bros. & Co., 62 Reade street, New York, manufacturers of Rules, when 21 years of age, started in the Hardware and Ship Chandlery business on Houston street, on his own account. This was in 1851. In 1868 he succeeded his father in the Rule business. This business was established in 1822, and it is stated by Mr. Belcher that the first Rules manufactured in the United States were made at this factory. Mr. Belcher is now 62 years of age, hale and hearty, and has been actively engaged in business since 1851.

RICHARD P. BRUFF.

Richard P. Bruff was born in the city of New York in 1827. He entered the Hardware house of Wolf & Gillespie in 1842, and became a partner in the house in 1852. In 1856 he organized the house of Bruff, Brother & Seaver, having as copartners his brother Charles and George Arthur Seaver, with James I. Day as special. This firm was dissolved by the war of the rebellion, and in 1864 Mr. Bruff became one of the associate managers of Russell & Erwin Mfg. Company. He occupied this position until 1874, since which time he has been practically out of business. We are indebted to Mr. Bruff for the following review of the business since the last Hardware dinner, to which a peculiar interest is added because of his familiarity with both foreign and domestic Hardware:

A dinner of the Hardware trade after a lapse of 30 years naturally suggests the inquiry, What is the condition of the trade as compared with a generation ago? The enormous growth of the country in population, in wealth and manufactures reasonably implies that Hardware is in no respect behind other industries in its development. At that time, about one-half the Hardware used in this country was of foreign manufacture, though American goods were rapidly coming into prominence by reason of their superiority of style and quality. Builders' goods were all of domestic manufacture, mechanics' tools were still imported to some extent, owing probably to a deep rooted prejudice in favor of a few English brands, rather than to their intrinsic superiority. Henry Disston had made great progress in driving Spear & Jackson's Saws from the Atlantic markets, though he had met with rather poor success on the Pacific Coast. Table Cutlery was being made extensively, but in Pocket Cutlery little had been yet accomplished. In the agricultural department, Birmingham still supplied us with all of our Trace, Ox and Log chains, and the cotton section with more than half its Hoes. Nearly all Anvils and Vises were still imported, though a few of reputable quality were made here.

The business of the country was done largely through jobbing houses, most of whom were either old-established concerns or their successors. Most of them were thoroughly trained merchants with ample capital, and carrying thoroughly equipped stocks for their respective trades. American manufacturers had few city agencies carrying stock, and were satisfied with the orders from jobbers of this and other large cities. A few houses confined their business to American goods, and some of them had agencies and sold for manufacturers' account on commission, but the number of such were small. After a lapse of 30 years, how great the change. The jobbers, then so numerous and powerful, have disappeared, and in their stead great manufacturing concerns have warehouses for the sale of their own goods, as well as for the sale of goods of a multitude of smaller makers. Few goods are now imported; indeed, a very complete stock can now be made up without any foreign additions.

Our manufacturers have become numerous and strong, and every year shows a marked increase in the variety and excellence of their productions.

Indeed, American Hardware will compare favorably with that of any nation and in many important departments is greatly superior.

In reviewing the greatly changed condition of the trade the Hardwaremen of the present day cannot too highly revere the memory of the veterans whose energy, skill and well-directed efforts have tended so largely to establish American Hardware in world-wide favor. Prominent among those worthies whose names should be inscribed on imperishable tablets may be mentioned Oliver Ames and his worthy sons, Samuel W. Collins, Warren Hunt, Henry Disston, the brothers William and Albert Angell, Increase Wilson, John Russell, David Maydole and Chas. Parker, whose goods are regarded as standards of excellence, and probably will retain their high reputation for generations to come.

ABRAHAM BUSSING.

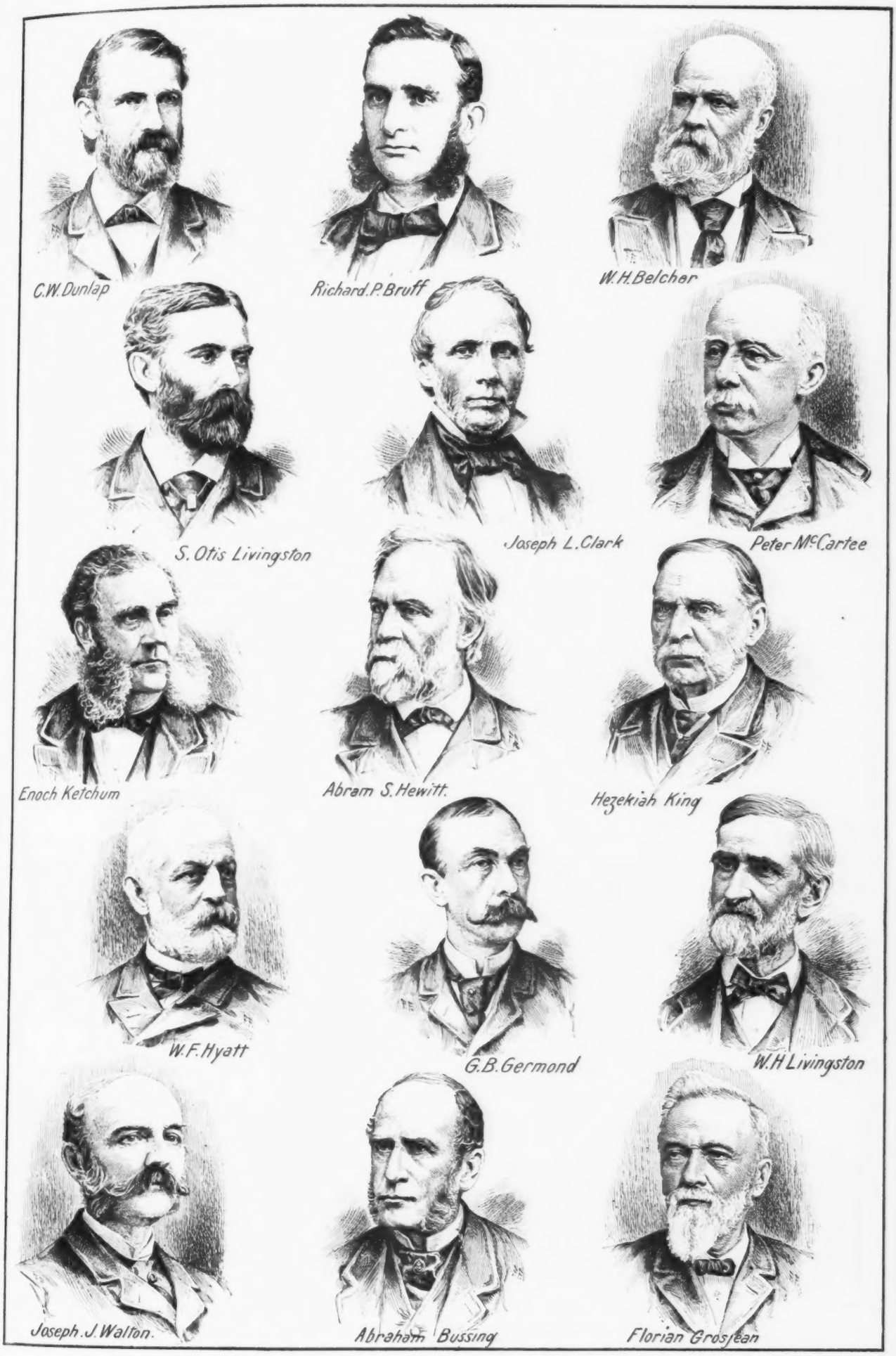
Abraham Bussing commenced business when he was 21 years of age as a clerk in his father's dry goods firm of E. & J. Bussing, who then occupied one of the Washington row of stores, located at the corner of William and John streets, New York. Afterward he had the management of the business of E. J. D. Kingsland & Co., manufacturers of Iron, Nails, &c. Subsequently this firm went out of existence, and the Ausable Horse Nail Company purchased their plant. This company were organized in 1861, and Mr. Bussing has had the sole management of marketing their goods since that time; as secretary up to the time of the death of their late president Edmund Kingsland, and since that time as president of the company. The success of the company since their organization is largely due to the energetic manner in which Mr. Bussing has introduced their goods, not only in this, but also in foreign countries.

JOSEPH L. CLARK.

Joseph L. Clark, who is now in his eighty-third year, entered the Hardware store of Sayre & Thurber, Utica, N. Y., as a clerk in 1825. He left Utica in 1830 and came to New York, where he clerked for Oakley & Mallory, jobbers and importers of Hardware, until 1834, when he bought out Mr. Mallory's interest, the firm becoming Oakley, Johnson & Clark. In 1840 he sold his interest in this concern and connected himself with Townsend, Sayre & Co., and the firm became Townsend, Clark & Co. a year or two later. This firm continued in existence until 1858, when Mr. Clark disposed of his interest and associated himself with Charles Scofield, as Clark & Scofield, which partnership continued until 1861. In 1862 Mr. Clark identified himself with Frank Freeman of Morristown, N. J., who carried on a wholesale and retail Hardware business, with whom he was interested for six years. During this time, however, he became treasurer of the Livingston Mfg. Company of Johnstown, N. Y., since which time he has been connected in a business way with the Livingston's interests. From this review of Mr. Clark's career it will be observed that he has been connected with the trade since 1825, when he began to learn the business at Utica, N. Y., and thus possesses the unique distinction of being the oldest Hardwareman still in business in the city and the dean of the trade.

C. W. DUNLAP.

C. W. Dunlap began his business career in 1844, when he entered the employ of the Hardware firm of John S. Gray & Co., Hartford, Conn. He remained with them for three years, then came to New York and entered the house of Wolf & Bishop, who carried on business corner of Gold street and Maiden lane. In 1851 he entered business on his own account, purchasing a retail stock of Hardware on Fulton street, Brooklyn, in which he continued for three years. In 1885 he acted upon the advice of Horace Greeley and went West, Milwaukee being his objective point. He had previously arranged to associate himself with Colgate Bros., who were then doing a large Hardware business in that city, making that his permanent residence should the arrangement prove


C.W. Dunlap
Richard. P. Bruff
W. H. Belcher
S. Otis Livingston
Joseph L. Clark
Peter McCartee
Enoch Ketchum
Abram S. Hewitt.
Hezekiah King
W. F. Hyatt
G. B. Germond
W. H Livingston
Joseph. J. Walton.
Abraham Bussing
Florian Grosjean

satisfactory to him after a six months' acquaintance with the business. He returned to New York, however, within a year and engaged with Jos. H. Adams, 242 Pearl street, the firm afterward being Adams & Coombs. In 1858 Mr. Dunlap left the firm of Adams & Coombs to engage in the Hardware commission business, associating himself with Mr. Burtis, as Burtis & Dunlap, the firm afterward becoming Dunlap & Mead. For the past 20 years Mr. Dunlap has been engaged in the Hardware manufacturing business, which he is now energetically carrying on, his office and salesroom being at 88 Chambers street, New York.

G. B. GERMOND.

G. B. Germond began his experience in 1856, when he entered the employ of J. H. Adams, afterward Adams & Coombs, and was with them at the time the 1860 Hardware dinner was held. In July, 1861, he connected himself with the Russell & Erwin Mfg. Company, with whom he occupies the responsible position of buyer.

FLORIAN GROSJEAN.

Florian Grosjean, president of the La lance & Grosjean Mfg. Company, 19 Cliff street, New York, began his business career as a bank clerk in France. Coming to America, he engaged in the importation and jobbing of House-Furnishing Goods in 1851, at 120 Pearl street. After continuing the business for a number of years he commenced the manufacture of Spoons, Ladles, &c., in 1861, the factory being located on Hester street, where he employed 15 operators. Under his energetic management the business grew so rapidly that in 1863 a factory was erected at Woodhaven, L. I., to which the business was moved, and employment given to 150 men. The present corporation was founded in 1869, and the offices and salesroom moved to their location in 1879. The business has continued to grow until at the present time the buildings at Woodhaven cover about 6 acres of ground, with 1200 people employed as operators in their factories.

ABRAM S. HEWITT.

Abram S. Hewitt was born July 31, 1822, at Haverstraw, N. Y. He graduated at the head of his class at Columbia College in 1842, and visited Europe in 1844. He was admitted to the bar in 1845, but soon gave up the profession on account of impaired eyesight and became associated with Peter Cooper in the iron business. Mr. Hewitt's subsequent successful public life, in which he was particularly prominent as a member of Congress and as Mayor of the City of New York, as well as his career as a leading iron master, are too well known to require more extended reference. He was at the 1860 Hardware dinner and responded to the toast "Iron and Coal." His quick appreciation of valuable improvements in iron and steel manufacture is well known, and the works in which he is interested have been the foremost to adopt methods in these lines. In Mr. Hewitt we have a representative broad-minded American citizen, who is deservedly held in very high regard.

W. F. HYATT.

In 1846 W. F. Hyatt entered the employ of Charles Merrill & Son, who were carrying on a retail Hardware business at 556 Grand street, New York. After remaining with them for three years, he went to California in 1849, but returned to New York in 1851 and re-entered the store of his former employers. The following year found him with J. B. Sargent, afterward Sargent & Co., who was then doing business at 24 Cliff street, where he remained until 1855. In 1856 Mr. Hyatt associated himself with Charles Sullivan, as Sullivan & Hyatt. The partnership was dissolved in 1861, and Mr. Hyatt continued in business for himself at 54 Beekman street until 1865, when he sold his business to Spencer & Underhill. Since that time Mr. Hyatt has been engaged in the manufacture of brass goods, as the Brass Goods Mfg. Company. The present commodious factory is located at 86 to 92 Third street, Brooklyn, N. Y., and salesroom at 88 Chambers street.

ENOCH KETCHAM.

Enoch Ketcham as a youth learned the carpenter's trade and, after serving a full apprenticeship, worked for a while at Newark and Morristown, N. J. In 1844 he entered the employ of N. E. James, who was then doing business in Cliff street, New York. Later on Mr. Ketcham associated himself with John D. Lock, under the firm name of Lock, Ketcham & Co., and engaged in business at 194 Water street. In 1857 the firm was changed to E. Ketcham & Co., and a factory was purchased in Williamsburg, L. I., for the manufacture of Stamped Ware. The New York office and salesrooms of E. Ketcham & Co. were located in 1857 at 289 Pearl street, which building they occupied until December 31, 1884, at which time the firm became merged with the Central Stamping Company.

HEZEKIAH KING.

Hezekiah King began his business life as an employee of J. D. Wolfe, Bishop & Co., 87 Maiden lane, New York, in 1840, and remained with them until 1855, during which time he had acquired an interest in the business. In 1855 he withdrew his interest from this house and started business in his own name at 86 John street, continuing as Hezekiah King until 1864, when the firm became H. & J. W. King. In 1872 the firm name again changed to King, Briggs & Co., and so continued until 1880, since which time Mr. King has continued business by himself. The gradual movement of the Hardware trade up town since 1855 is forcibly shown by the different locations in which Mr. King has found it expedient to do business since he first started in Maiden lane. The changes that he made are in the following order: 86 John street, 51 Beekman, 92 Beekman, 80 Chambers, 596 Broadway, 111 Chambers, and then to 106 Chambers street, where he is located at the present time.

S. OTIS LIVINGSTON.

S. Otis Livingston commenced his business career in 1845 at his brother's Hardware establishment in New York. In 1849 he was admitted as a partner, the style of the firm then being changed to W. H. Livingston & Co. In 1863 the Livingston Mfg. Company were formed, Mr. Livingston attending to the selling of the factory's product, with headquarters in New York. In 1865 he established the Livingston Nail Company, who now have their salesroom at 104 Reade street.

W. H. LIVINGSTON.

W. H. Livingston entered the wholesale Hardware establishment of Palmer, Elliott, Huntington & Co., in New York, as a young man in 1837. In the early part of 1838 he began business for himself in Cedar street, jobbing goods for cash. By persistent effort he succeeded in establishing a growing business, and in 1849 his brother, S. Otis Livingston, was admitted as a partner, under the firm name of W. H. Livingston & Co. In 1863 the Livingston Mfg. Company were formed for the manufacture of Saws and Files, with the factory at Johnstown, N. Y. Mr. Livingston removed from New York to Johnstown to take charge of the factory, and has resided there up to the present time.

PETER M'CARTEE.

Peter McCartee, vice-president of the Stanley Works, New Britain, Conn., and 79 Chambers street, entered the Hardware business, a lad, in 1848, as an employee of Wetmore & Co., Vesey and Washington streets, New York. Afte remaining with this firm for three years he accepted a position as salesman with J. K. Lawson, Newburg, N. Y. In 1854 he returned to New York and entered the house of Cornell & Willis, afterward Willis, Cornell & Cary, 36 Cortlandt street. In 1857 Mr. McCartee took charge of an association of six New Britain, Conn., manufacturers, which association continued four or five years. As a result or outcome of this association the following well-known firms were formed: Stanley Works; Landers, Frary & Clark; Stanley Rule & Level Company and Humason & Beckley Mfg. Company. The Stanley Works, at the time they were members of the association, was composed of F. T. Stanley, manufacturer of Wrought Bolts and the Stanley Works. F. T. Stanley was subsequently consolidated with the Stanley Works and Mr. McCartee was intrusted with their interests at the time the association was terminated. Including his relations with the Stanley Works during the association Mr. McCartee has been continuously connected with these works for 35 years.

JOSEPH J. WALTON.

Joseph J. Walton, president and treasurer of the Walton Mfg. Company, 60 Cortlandt street, entered the employ of Geo. H. Swords, 116 Broadway, New York, in 1848. He remained with him until the firm became Geo. H. Swords & Walton. The business carried on by the

firm was that of jobbing Hardware, of which the greater part, if not all, was imported. We hear of Skates being sold by this firm at $40 a pair. The runners were made of Swiss steel, the woods of mahogany, elaborately inlaid with German silver. The firm name was subsequently changed to Walton Bros., then to Jos. J. Walton, and about 1887 to the Walton Mfg. Company.

Shot in Paper Boxes.

COLLIER SHOT TOWER WORKS, St. Louis, Mo., are packing Shot in 1-pound paper boxes, 25 to a case, as shown in Fig. 1. The paper box has much the

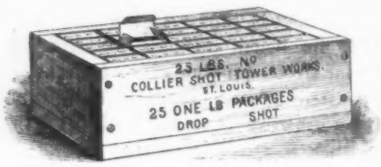


Fig. 1.—Shot in Paper Boxes.

appearance of a pound box of Rivets, and is shown in Fig. 2. The boxes containing Drop Shot have red labels; Buck Shot boxes have yellow labels, and light blue labels are used on boxes of Chilled Shot. The advantages claimed for this style of packing are that it saves labor, that there is no mixing of sizes, that no over-weight is given, as in weighing out Shot by the pound, and that there is no tying or

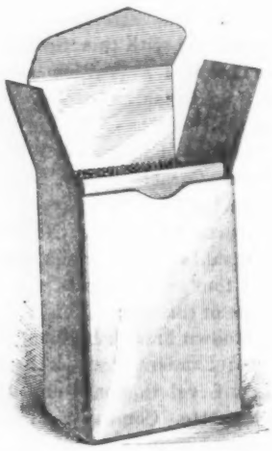


Fig. 2.—Style of Shot Packages.

wrapping up of the package, the Shot being ready to hand a customer when called for. The manufacturers state that the price is 1 cent per pound over the 25-pound bag price.

Twine News.

THERE IS a possibility that a branch of the Belfast Ropework Company, Limited, of Ireland, which is the largest Cordage manufactory in the world, may be established in or near Chicago. There is money ready for investment in a plant with necessary machinery awaiting the report of three experts who are now in the United States examining the territory.

John Marshall Weir, who heads the expedition, has charge of the territory covered by Illinois, Minnesota, Wisconsin, Michigan, Missouri, Kansas, Nebraska and Dakota. He is now paying special attention to the sale of Twine, the radical reduction of the duty on that material for the farmer making it possible for the Belfast establishment to compete successfully with the Cordage Trust. In speaking of the proposed enterprise to a reporter, he said: "We originally intended to establish a factory in Brooklyn, N. Y., but I became convinced that Chicago or its immediate vicinity would be a better place, if we do decide to start a factory in this country. It was the reduction of the duty on Twine to $\frac{7}{10}$ cent, under the McKinley bill, that first gave us the idea of establishing a branch factory in this country. If we start the factory we will bring our machinery from the other side, and the capital stock will be £250,000. The scheme may be abandoned, as there are several things against it. Labor is cheaper on the other side, and we would have to pay duty on several articles which it would be necessary to import. However, when we have looked the territory over thoroughly and have held a consultation we may decide to carry out the scheme. Mr. Smiles, the secretary of the company, will arrive here early in March and the matter will be reported to him for his consideration. I will remain in the United States until April, and I think if it is decided to establish a branch factory here a site near Chicago will be selected."

Trade Items.

AT THE STAR LOCK WORKS, Philadelphia, Hillebrand & Wolf, proprietors, business during 1891 is reported as being a little in advance of any previous year. The number of hands has been about 100 for several years and always on full time. They are constantly increasing their manufacturing facilities, however, so that the output shows a steady expansion. A new catalogue is in course of preparation, showing various improvements in both Scandinavian and Trunk Locks, as well as a new patented Trunk Stay, which is likely to prove very attractive to the trade. The Carboy Stand which they placed upon the market about a year ago—of which a description appeared in these columns—has proved a great success, and evidently meets a want in that direction.

THE FIRM OF Howard & Morse, 45 Fulton street, New York, will continue without change in name or without interruption of business. David R. Morse, his sons and the sons of the late John W. Howard will constitute the firm.

THE ORR & LOCKETT HARDWARE COMPANY of Chicago lost one of their salesmen by death last week. His name was George Carpenter and he was a very bright young man, with excellent business qualifications. The remarkable fact is noted in this connection that the death of Mr. Carpenter is the first that has occurred in the force of this establishment since it was started in 1872 and in Mr. Orr's previous experience when in business in Ohio. The firm have about 60 employees at present.

THE AMERICAN WHEEL COMPANY, whose headquarters are now at Indianapolis, have prepared a proposition to submit to their creditors, which is that if the creditors will agree to allow them to resume control the company will pay in cash 10 per cent. of their aggregate indebtedness on or before March 1, 1892, and 10 per cent. on or before September 1, 1892. The balance of indebtedness they offer to pay in installments of 10 per cent., the last to be paid September 1, 1895. The company's promissory notes bearing 6 per cent. interest will be given for all deferred payments. The total indebtedness is $1,663,000 and the gross value of the plant, stock manufactured and raw material is $3,000,000. Receiver Butler with a committee of the creditors has after a consideration of the company's status found that the assets exceed the liabilities by about $700,000.

C. E. WOODRUFF of Chicago and Hugh MacGinley of Spokane Falls, Washington, have opened a Hardware house at Spokane Falls under the style of C. E. Woodruff & Co. Mr. Woodruff has his headquarters in the Northern Office Building, Chicago, while Mr. MacGinley, who for several years was buyer for the Spokane Falls Hardware Company, will be resident partner. They have taken a large warehouse and stocked it with a full line of Heavy Hardware and some Agricultural Implements. They will use Spokane Falls as a distributing point, from which to reach the large section naturally tribututary to it. They are exclusive agents for the Plano Mfg. Company and the Gale Mfg. Company's Agricultural Implements. In addition to carrying a stock of goods they propose to take orders for everything that may be needed by dealers in that section. The venture is somewhat of an experiment, but so far the results have been highly satisfactory, and the members of the firm now have every reason to expect that they will achieve success.

HORTON, GILMORE, MCWILLIAMS & Co. of Chicago have laid in a stock of high-class baseball bats and balls to meet the requirements of the trade in that line for the coming season. They have also secured a handsome line of clocks.

THE DETROIT *Tribune* of February 14, in an article relating to the prominent houses of that city, refers to the firm of Buhl, Sons & Co., Detroit, Mich., which was founded in 1855 by Christian A. Buhl and Charles Ducharme as Buhl & Ducharme. In 1872 Theodore D. Buhl, a son of the senior partner, was admitted to partnership as Buhl, Ducharme & Co. Mr. Ducharme died in the following year and the business was continued by the surviving partners until 1880, when the name was changed to Buhl, Sons & Co. Christian H. Buhl, Theodore D. Buhl, J. M. Thurber, Charles H. Jacobs, Frank H. Buhl and David Adams are the present members of the firm. The location of the premises occupied by the firm gives them exceptional facilities for the transaction of their large business as manufacturers of Iron and Nails and importers and jobbers of Hardware. The firm are also owners of the Sharon Iron Works at Sharon, Pa., where employment is given to 1200 hands, who turn out Bar, Band, Hoop and Sheet Iron, Steel Nails, &c. Frank H. Buhl is general manager of these works, and David Adams secretary and treasury.

THE PORTLAND, ORE., branch of Mitchell & Lewis Company of Racine, Wis., and Staver & Walker of Portland have consolidated, under the name of Mitchell-Lewis & Staver Company, with W. H. Mitchell president, G. W. Staver vice president and treasurer and Frank L. Brown secretary. The general office and headquarters of the new firm will be in the new Market Block, where they will also carry a complete line of samples of everything in the Machinery and Vehicle line, giving special attention to their Carriage repository. They will also continue to occupy the building formerly occupied

by Mitchell & Lewis Company on the corner of Front and Taylor streets, and in addition to these salesrooms they purpose building a large warehouse on the track, where cars can be unloaded and loaded quickly and cheaply. As it is their intention to make a specialty of the jobbing trade in carload lots, they purpose continuing their branch houses at Seattle, Spokane, Walla Walla, Colfax, La Grande and other points throughout the Northwest.

THE KNAPP & COWLES MFG. COMPANY, Bridgeport, Conn., have been re-organized, with L. S. Catlin president, Wm. Suggett vice president and Geo. S. Knapp secretary and treasurer. The company now are in the best possible condition to continue the manufacture of their large line of Screw Drivers, Mincing Knives and House-Furnishing Goods. Their factory is well arranged, and suitable for present requirements, with sufficient room for an extension of their plant when desirable. Mr. Knapp has been long and widely known to the trade and his recent connection with this company will be a matter of congratulation among his many friends.

UNDER DATE OF February 17 it is announced that the American Stamping Company have purchased the extensive plant, business and good will of the old established house of Joseph Scheider & Co., Brooklyn, N. Y., and have also acquired control of the Eastern Tinware Company, Portland, Conn. With increased capital and facilities the new company will continue the manufacture of the full line of Tinware, &c., formerly produced by Joseph Scheider & Co., adding such new goods from time to time as the trade may require. The paid-up capital of the new company is referred to as $450,000. The officers are as follows: Joseph Scheider, president; J. A. Einstein, vice-president, and E. Ettenheimer, secretary and treasurer. These persons, with Frank A. Einstein and A. Cohn, comprise the Board of Directors. It will thus be seen that the members of the old firm are identified with the company just formed.

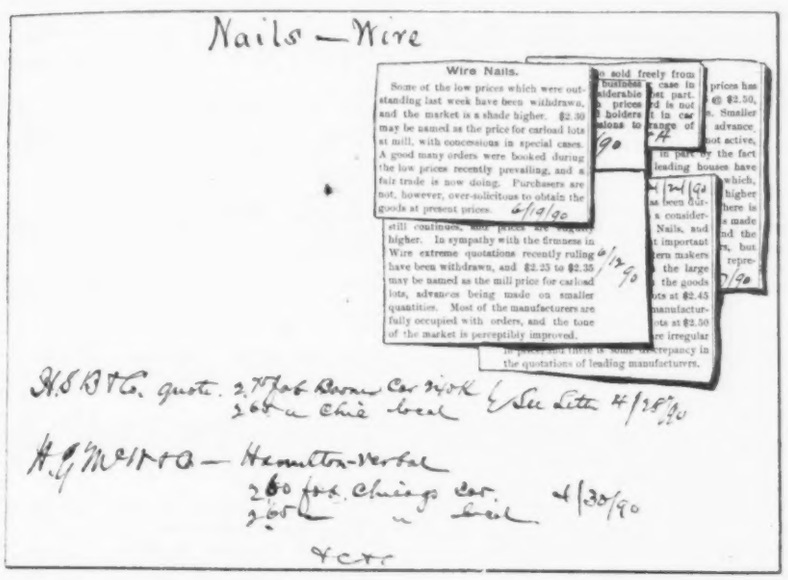
THE FIRM OF Bignall & Keeler Mfg. Company, St. Louis, will not undergo any change consequent to the death of M. C. Bignall, president of the concern, which occurred on the 5th inst. Mr. Bignall has had no active management of the business of the company for two years past, his sickness keeping him confined to the house most of that time. Geo. A. Wells, vice-president, will assume the duties of president until the annual election. N. O. Nelson is secretary and treasurer, and E. L. Pierce is superintendent of the works. They are at present enjoying a large trade and advise us that the outlook is very encouraging.

JOHN A. MILLER, St. Louis, Mo., manufacturer of Miller's Vehicle Wrench, has just returned from Atlanta, Ga., where he attended the convention of the Carriage Builders' Association. He secured large orders from a number of the leading manufacturers, and has made arrangements with 35 leading carriage manufacturers to supply them with wrenches during the present year. He advises us his sales will probably amount to over 250,000 wrenches during the year.

ANNOUNCEMENT IS MADE that that the partnership heretofore existing between Samuel E. Winslow and Albert B. Curtis, under the firm name of the Winslow & Curtis Machine Screw Company, Worcester, Mass., has been dissolved by mutual consent. Frederick E. Reed has purchased the interest and good will of Samuel E. Winslow in the firm, and has entered into a copartnership with Mr. Curtis under the style of The Reed & Curtis Machine Screw Company, as successors to the Winslow & Curtis Machine Screw Company. The new company assume the indebtedness of the former firm, and will collect all outstanding bills.

EASTMAN & KRAUSS RAZOR COMPANY, 98 Chambers street, New York, contemplate adding an extension to their factory at Stapleton, S. I. They report themselves as very busy filling large orders, and that the contemplated enlargement of their plant is the result of their increasing business. The company are the owners of several patented articles pertaining to their business. David Eastman, president of the company, has been identified with the Cutlery trade for over 25 years.

W. A. FILLMORE of Zanesville, Ohio, who has been a stockholder in and president of the Zanesville Hardware Company ever since their organization, has severed his connection with that concern, and will open a large wholesale and retail Hardware establishment at 139 Main street, in that city. Mr. Fillmore has had 33 years' experience in this line, and makes this new departure under favorable circumstances.



Method of Using Extracts from The Iron Age.

Keeping Track of Prices.

FOR THE FOLLOWING contribution we are indebted to a Western correspondent. The points made by him in regard to business methods in keeping posted on prices will, we are confident, be perused with much interest by the trade and the illustration of the manner in which he utilizes *The Iron Age* be suggestive to many of our readers:

A good memory and a good judgment are useful in any department of any business—they are essential to good buying and they need to be eked out and supplemented by everything on the market, present and prospective. In this sense the "condition of trade" outranks "current prices" in *The Iron Age*, for the tendency of prices up or down often has a deeper significance than the exact price or discount anybody may name on any stolid article—though current prices and special prices and cut prices must not be overlooked in the system of any man whose ambition or business it is to be posted, only let him not forget to watch for the straws that show the current and the indications that often go before and point to prices yet unnamed.

My system is in no sense ornamental, but it is built for business and seeks to reach an end by the shortest cuts. It simply scissors what it finds printed to its purpose, pastes it under its proper heading, and there supplements it from time to time by pen and pencil references to mail quotation, notes of verbal prices, &c., all to wait their own good time to fufill their mission of timely information.

This with the "Current Price-List" of *The Iron Age*, and that of one or two other journals that experience has shown to be reasonably trustworthy, is the basis of my scheme, and for the rest it is a question of eternal vigilance.

After this explanation nothing remains but to give you a sample of my work as outlined, which I do briefly, as my time is short and the system seems to explain itself, only regretting that the practical carrying out of my plan necessitates such wholesale mutilation of careful editorial work, for which I can only plead in extenuation the necessity that knows no law and the more practical every-day shape such work takes on after I have classified and arranged it. Not many of the trade journals are worth clipping at all.

In my business I use a paged and indexed "Invoice Book," 10 x 14 size, as reproduced in the accompanying illustration. The manila paper is smooth enough for pen or pencil notations, strong enough to stand any amount of handling, and so shaped as to receive indefinitely without bulging. The slips may be removed at any time when they seem to have served their purpose. I find, however, they frequently help me to a conclusion by a comparison of prices at different dates, long after their time of usefulness seems past.

Glass Rack.

IN REPLY to the inquiry which we laid before the trade in a recent issue we have the following from a Hardware merchant in the West, in which he describes his method of constructing an inexpensive Rack for accommodating a retailer's stock of Glass. Our correspondent also makes a suggestion which may be of service to some of our readers:

If "Glass Rack" wishes a good and cheap Rack for retailing Glass he can make one that will be at least convenient. If he will take the largest size box he has and set it on end in some convenient place; take the next smaller box, and after removing one side nail it lightly against the first box, and so on to the smallest size. I have over 30 sizes arranged in that manner, and find it very convenient. He can put a tag on the top of each box, giving the size, if he chooses, together with price. I also have a plan of loaning a customer a box to carry his purchase home, requesting him to return the box, which they will do nine times in ten.

Price-Lists, Circulars, &c.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York: Planished Ware, Agate Iron Ware, Blue and White Enameled Ware, White Enameled Ware, Wrought Steel Hotel Ware, Plain and Deep Stamped Ware, Galvanized, Polished and Bright Iron Ware, Japanned Ware, &c. In their illustrated catalogue and price list of February, 1892, they refer to the many new and useful articles that have been added to their assortment, calling especial attention to their case lot system, which they state insures more promptness in shipment and greater safety in transportation.

NORTHWESTERN MALLEABLE IRON COMPANY, Milwaukee, Wis.: Catalogue No. 2, entitled "Malleables." This is a handsome publication of 36 pages, giving illustrations of Hardware specialties made of malleable cast iron. There are nine pages of Wagon Clevices alone, showing a great variety of patterns and sizes. Then follow specimens of Harrow Clevis, Evener Clevis, Hinge Swivel Clevis, Monarch Clevis, End Clevises, Cross Clevises, Double Shovel Clevises, Plow Clevises, covering five pages, Whiffletree Hooks, Eye Ferrules, Stake Rings, Wear Irons, Bolster Plates, Pole Tips, Corner Irons, Steps, Stake Irons, Wrenches, Swivels, Oar Locks, &c. The company call attention to the fact that they are prepared to make anything to order in the malleable line, their large facilities enabling them to get out work promptly.

THE COLDWELL LAWN MOWERS, W. A. Comstock, Western agent, 34 Wabash avenue, Chicago: This is a neat little pamphlet of some 12 pages, fully illustrating and describing the Lawn Mowers, Smoked Beef Cutters, Lawn Rakes and Brush Trimming Machines manufactured by the Coldwell Lawn Mower Company of Newburg, N. Y. The special features and advantages of these different machines are comprehensively yet tersely set forth in Mr. Coldwell's pamphlet, which is addressed particularly to the Western trade.

NICHOLS BROS., successors to E. S. Hulbert & Co., Bernardston, Mass.: Butchers' and Cooks' Knives, Market and Packing-House Cleavers, Abattoir and Butchers' Steels, Grocers' Cheese Knives and Butter and Lard Spades. These goods are illustrated in their 1892 catalogue, accompanied by list prices. In connection with the catalogue a discount sheet is issued. Attention is directed to their Knife-Handled Cleavers, for which superiority is claimed.

It Is Reported—

That Henry and Dell Beebe have bought the Hardware store of W. A. Knowlton at Findley's Lake, N. Y.

That the building of the Langstaff Hardware Company, Memphis, Tenn., was destroyed by fire on the 8th inst.

That the Stove and Tin business of the late H. D Lewis of Southold, N Y., has been purchased by A. T. Horton.

That Supervisor Andrew Spencer has purchased an interest in the Hardware concern of J. E. Smith of Otsego, N. Y.

That Barnes & Son, dealers in Hardware, Colorado Springs, Col., have opened a branch Hardware store at Cripple Creek in that State.

That John L. Phillips and Henry Davis will commence the Hardware business at Girard, Ohio, about March 1.

That the stockholders of the Morris Hardware Company, Youngstown, Ohio, met on the 8th inst. and elected the following directors for the ensuing year: J. L. Botsford, W. J. Hitchcock, L. E. Cochran, H. M. Garlick, J. H. Morris, W. J. Whitworth and Hugh B. Wick. The officers elected were as follows: H. M. Garlick, president; W. J. Hitchcock, vice-president; J. H. Morris, general manager, and W. J. Whitworth, secretary and treasurer.

That in the destructive fire at Memphis, Tenn., on the 8th inst., the Langstaff Hardware Company suffered a loss of $155,000, insurance being $125,000, so that the total loss is not heavy. The loss on stock was $120,000 and on building, $35,000; the insurance was $100,000 on the former and $25,000 on the latter. H. Wetter Hardware Company's establishment was also destroyed by the fire. Loss, $100,000; insurance, $70 000.

That Thomas Mulcare & Co., Radford, Va., will at once build a brick block corner of Wadsworth and Second streets, which they intend to occupy as a Hardware store.

That A. D. Dye and William Breese have purchased the stock in the old store of A. D. Dye & Co., Hardware dealers, Towanda, Pa., and will continue the business under the firm name of Dye & Breese. Mr. Breese had been for 15 years connected with the firm.

That P. R. Smith, Gloversville, N. Y., is about to move his stock to larger quarters.

That Kennedy & Bro., Hardwaremen, Johnston, N. Y., are about to dispose of their business, having decided to retire.

That Messrs. Seaman & Crancer have bought the Hardware business of H. T. Hollister, at Cortland, N. Y., and will conduct it hereafter.

That L. L. Smith will soon erect a building for a Hardware and Implement business at Ravenna, Mo.

That Mr. Mater and S. P. Swisher have opened a Hardware store at Danville, Ill.

That J. H. Decker has removed his Stove and Tin store to the Argyle Block, Findlay, Ohio.

That J. M. Henderson & Co. will open a new Hardware store at Martin's Ferry, Ohio.

That the Hardware house of R. S. Thompson & Co. has been removed to the Sarrell Block on Main street, Pine Bluff, Ark.

That C. S. Ellis has opened a Hardware store at Corning, Pa.

That the Pratt Hardware and Implement Company of Pratt, Kan., have been chartered. The capital stock is $12,000. The directors are J. M. Patterson, W. T. Roseberry, W. M. Patterson and O. S. Patterson of Kansas City, Mo, and E. L. Hood and Isaac Holmes of Pratt, Kan.

That William S. Rapp has repurchased and taken possession of the Stove and Tinware store at 248 North 8th street, Reading, Pa.

That H. E. Elston, Hardware merchant, Norristown, Pa., is about to commence the erection of an all-iron building, the first in Norristown.

That Andrew Rapp of Carpenterville, N. J., has purchased the Hardware store and lumber yard of Clark & Cooley at Bloomsbury, N. J.

That a new Hardware firm under the style of W. M. Van Holde & Co. has made its appearance at Marion, N. Y.

That D. Shwell has opened a Tin and Hardware business at Gainsboro, Mani.

That the Williams Hardware Company have been organized at San Francisco, Cal. The capital stock is $50,000. The directors are S. G. Williams, E. W. Williams, S. G. Williams, Jr., H. S. Warner and S. C. Wallis.

That Robert Kearns has disposed of his interest in the Hardware business at Kaukauna, Wis., to Butler Bros.

That Gilpin & Frick have recently purchased the Hardware stock of J. H. Griffin of El Reno, Oklahoma Territory, and will hereafter run a branch store at that place.

That J. H. Bass & Bro., Canton, Ill., will remove to more commodious quarters.

That the establishment of Lewis & Shoendorfer, dealers in Hardware, Cleveland, Ohio, was destroyed by fire on the 6th inst.

That the store of H. W. Young, dealer in Hardware, Wellsburg, N. Y., was consumed by fire on the 5th inst. Loss, $20,000; insurance, $25,000.

That D. W. Mossman & Co., Galena, Ohio, are going to put in a full line of Hardware shortly.

That White & Mitchell will open a Hardware store at Creede Camp, Col., at an early day.

That A. W. Rolston, lately in the employ of Falconer & Martin, Melita, Man., has opened a Hardware establishment at Oxboro.

That Almira, Wash., presents an opening for a Hardware store.

That the Garfield Hardware and Mercantile Company have just been organized at Garfield, Wash., with a capital of $25,000. R. C. McCroskey, Greenville Holbrook, William Duling, Bryant Westcott and G. W. Nye were elected directors for the ensuing year.

That the Hardware store of Sires & Tully, Trenton, Mo, was burglarized on the 10th inst. About $50 worth of goods was stolen.

That the Francis stock of Stoves and Tinware at Fond Du Lac, Wis., has been purchased by J. L. Roblee of Eldorado, who will put in a large stock of Hardward.

That the Hardware firm of D. S. Phelps & Co., Detroit, Mich., has been incorporated. Capital stock, $15,000.

That William Rimmermann's new Hardware store at Lincoln, Ill., is open for business.

That the Littlefield Implement Company at Peoria, Ill., have been incorporated. The capital stock is $30,000. The stockholders are: W. E. Littlefield, F. E. Cole and W. P. Roberts.

That Dr. John Higgins has sold his interest in the Brewster Hardware Company, Waterford, N. Y., to several parties, and has retired from the concern.

That the Hardware firm of Stevens & Hills expect to remove their stock to their new quarters in the Hazleton Block, Oneonta, N. Y., about March 1.

Exports.

PER BARK ENOS SOULE, FEBRUARY 6, 1892, FOR MELBOURNE, AUSTRALIA.

By E. & P. Hayden.—1 case Saddlery Hardware.
By Lalance & Grosjean Mfg. Company.—2052 pounds Household Utensils.
By Edward Miller & Co.—4 packages Lamp Goods.
By Yale & Towne Mfg. Company.—2 packages Locks.
By Herbst Bros.—2 boxes Hardware.
By Alfred Field & Co.—1 case Forgings.
By R. H. Dana & Co.—16 cases Axes, 25 cases Handles, 44 cases Axes.
By Edward Miller & Co.—8 packages Lamp Goods.
By Mailler & Quereau.—38 boxes Lamp Goods
By W. K. Freeman.—10 dozen Iron Rakes, 8 cases Hardware.
By the F. B. Wheeler Company.—3 packages Lawn Mowers.
By William E. Peck.—12 cases Bird Cages, 1 case Saws, 2 cases Plated Ware, 10 cases Axe Handles, 1 case Plated Ware, 1 case Hoes, 2 cases Saws, 9 cases Axes, 2 cases Wringers, 9 cases Axes, 1 case Plated Ware.
By R. W. Cameron & Co.—1 box Axes, 1 box Miter Knives.
By S. Hoffnung & Co.—2 cases Barrows.
By R. W. Forbes & Son.—1 case Flint Paper, 26 cases Hardware, 24 cases Axes, 13 packages Hardware, 3 crates Churns.
By H. W. Peabody & Co.—1 case Hardware, 173 dozen Tools, 6 dozen Axes, 4 cases Hardware, 1 case Hoes, 200 reels Wire, 1 case Hardware, 4 cases Bolts, 1 case Rakes, 49 cases Ammunition, 5 cases Tools, 4 cases Nails, 20 cases Wringers, 1 case Lampware, 5 cases Hardware, 1 case Nails, 2 cases Pumps, 4 crates Fiber Ware, 25 reels Barb Wire, 5 cases Hardware, 2 packages Farming Implements, 11 packages Hardware, 17 cases Wringers, 1 case Traps, 10 cases Wire Strainers, 3 packages and 1 case Hardware, 5 cases Tacks, 1 case Traps, 1 case Rivets, 2 cases Scoops, 1 case Strops, 55 packages Nails, 20 cases Tacks, 1 case Hoes, 1 case Hardware, 2 packages Pumps, 4 cases Cash Drawers, 200 reels Wire, 4 cases Hardware, 1 case Rakes, 12 dozen Edge Tools, 1 case Rakes, 10 packages Hardware, 6 cases Tacks, 1 case Chalk Lines, 57 packages Hardware, 3 cases Pumps, 47 cases Tools.
By W. H. Crossman & Bro.—50 dozen Axes, 1 case Traps, 48 kegs Nails, 1 barrel Blocks, 31 cases Hardware, 19 packages Grindstone Fixtures, 2 cases and 2 packages Hardware, 58 cases Axes, 1 case Traps, 8 cases and 20 packages Builders' Hardware, 12 cases Axes, 3 cases Hatchets, 6 cases Wringers, 2 cases Hardware, 20 cases Axes, 4 casks and 2 cases Pump Parts.
By Strong & Strowbridge.—29 kegs Nails, 32 cases Axes, 5 cases Hatchets, 1 case Locks, 1 case Razor Strops and Chalk Lines, 1 case Ferrules, 2 cases Lampware, 3 cases Bush Hooks, 1 case Hammers, 1 case Emery Wheels, 2 cases Bolts, 1 case Traps, 45 kegs Nails, 1 case Braces, 2 cases Choppers, 1 cask Pumps, 1 case Wrenches, 2 packages Crucibles, 1 case Hammers, 13 cases Lanterns, 10 cases Wringers 8 cases Nails, 9 cases Hammers, 3 cases Revolvers, 1 case Hardware, 6 cases Empty Cartridge Shells, 2 cases Cartridges.
By McLean Bros. & Rigg.—4 cases Hammers, 1 case Hinges, 7 cases Hardware, 3 cases Choppers, 35 packages Rakes, 2 cases Hammers, 13 dozen Braces, 3 cases Saws, 4 cases Hardware, 1 case Braces, 8 cases Agate Ware, 10 dozen Scales.
By Strong & Trowbridge.—2 cases Hardware, 9 cases Nails, 1 case Guns, 1 case Hardware.

PER BARK EVANELL, FEBRUARY 6, 1892, FOR BRISBANE, QUEENSLAND.

By Collins & Co.—82 dozen Edge Tools.
By Pairpoint Mfg. Company.—1 cask Plated Ware.
By Winchester Repeating Arms Company.—100,000 Cartridges, 12 sets Tools.
By H. W. Peabody & Co.—1 case Carriage Hardware, 1 case Traps, 14 cases Hardware, 2 dozen Seed Sowers, 1 case Farming Implements, 3 packages Lawn Mowers, 3 packages Pumps, 400 reels Barb Wire, 1 case Builders' Hardware, 24 cases Lampware, 1 case Rat Traps, 5 crates Churns, 4 cases Builders' Hardware, 1 package Washers, 1 case Edge Tools, 1 case Wagon Jacks, 1 case Carriage Hardware, 22 packages Builders' Hardware, 3 cases Lampware, 15 crates Refrigerators.

PER BARK MARY HASBROUCK, FEBRUARY 10, 1892, FOR AUCKLAND, NEW ZEALAND.

By F. R. Plumb.—11 cases Tools.
By Arkell & Douglas.—3 cases Hardware.
By H. W. Peabody & Co.—1 case Emery Wheels, 2 cases Farming Implements, 5 cases Bolts.
By Edward Miller & Co.—24 cases Lamp Goods.
By the F. B. Wheeler Company.—10 packages and 6 cases Hardware, 44 cases Axes, 4 cases Lawn Mowers, 3 cases Hardware, 4 cases Axes, 1 case Hardware.
By R. W. Forbes & Son.—2 cases Hoes and Rakes, 9 cases Horse Nails, 13 boxes Carriage Bolts, 53 packages Axes and Hammers.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

There has been some increase in the volume of business in house painters' goods and certain lines of specialties, chiefly through the medium of orders sent in by traveling salesmen who seem to now be making progress in the direction of placing goods to be delivered during the early spring months. Buyers' operations are conducted in a very conservative manner and show no marked improvement over the average run for this period of the year. Local retailers are buying indifferently, and other city trade do not manifest anything more than ordinary interest. In grinders' stock there have been no important developments, and outside of an advance in Pig Lead base materials remain wholly unchanged. The situation is then without any feature suggestive of influence in the latter line that would tend to disturb values for manufactured goods, the majority of which are now going out at prices very close to cost of production.

White Lead.—At headquarters it is reported that the movement in corroders' product is quite satisfactory in most quarters, and the local branches appear to be getting fully their share, all of which would indicate that preparations for spring season trade distribution are making with some degree of confidence. Sales of the cheaper form of pigment are running somewhat irregular, yet very fair in the aggregate amount. With the price of Pig Lead higher there has been less tendency to look for lower prices for White Lead, and the concessions made by jobbers, it is also noted, are hardly as liberal as those that were granted at intervals some time ago.

Red Lead and Litharge.—Orders for glassmakers' grades of Litharge have been more numerous, and in some instances for larger quantities. Improvement is noted also in sales of the higher grade, also of Red Lead, but the buying is as yet of conservative type.

Oxide Zinc.— American manufacturers are busily engaged with deliveries on contracts, and that movement, to all accounts, is taking up the greater portion of the output of Eastern producers. New business has been moderate, but with the general situation favorable, prices for the various grades of the article are well maintained. Foreign brands meet with rather slow demand at present and remain without change in value.

Colors.—Taken as a whole the movement in Dry Colors is fair, with improvement noted in various lines that are consumed in manufacturing industries outside of the Paint trade, and a full average seasonable distribution of house painters' goods also. The late reduction in prices of Quicksilver Vermilion has helped along sales of the Color, most manufacturers noticing some increase over the business of the preceding week. The better class of Artificial Vermilion that sells at about 25¢ @ 35¢ is moving very fairly also, but the very cheap varieties are slow at present. Other Reds and Blues in general, Yellows and Browns hold their own in prices. The situation in Oil Colors and Ready-Mixed Paints has undergone no change and the movement is as yet rather slow.

Miscellaneous.—Chalk has undergone no change, arrivals during the week having been moderate, with the demand slow. Orders for Whiting come in rather light at present and the offering by some manufacturers is freer, but lower prices do not appear to be made. Putty is still somewhat irregular in price, yet without positive change. Barytes, Terra Alba, Talc and China Clay are selling to a fair extent, but the movement is of routine character and chiefly at prices within the range that has ruled for some little time past.

Oils and Turpentine.

The past week has been almost an exact repetition of its immediate predecessor, as far as developments in the market for Animal and Vegetable Oils are concerned. Drawing the line at higher prices asked for Lard Oil, the changes have been very slight, and apart from evidence that latest efforts in the direction of conciliating the conflicting Western Linseed Oil interests have been fruitless, there is nothing new in the general surroundings. Business is hardly as full in volume as it naturally should be at this season of the year, since speculation fails to revive or export interest broaden out, yet the leading Oils pass into the home channels of consumption at a fairly good rate, and values keep quite steady.

Linseed Oil.—The National Oil Company appear to have been unsuccessful in their late effort to effect an agreement with outside Western crushers, and the condition of affairs, therefore, remains just as it was at the beginning of the year. Lower prices for Linseed Cake and irregular market in raw material tend to complicate the outlook now that unrestricted competition in Oil during the spring season is almost certain to be experienced. However, it does not appear that the offering of Western Oil in Eastern territory is more urgent at the present time than it was a week ago, or that lower prices have been named; 34¢ for carload lots and 35¢ for smaller quantities are the quotations. City brands remain at 37¢ for domestic Seed product, and 56¢ for Calcutta.

Lard Oil.—City pressers have disposed of nearly their entire product of prime Oil at 57¢, and nearly all arrivals from outside sources have been worked off at 56¢. The demand is still very good, leaving the position of the market strong, and sellers are now asking 1¢ advance upon the prices above quoted. In the lower grades there has been very fair business at stiff prices.

Cotton-Seed Oils.—Neither crude nor refined products have improved in the slightest degree. Exporters' purchases have been few in number, and rarely involved more than 200 to 300 barrels on a single order. Home trade buying has dragged wearily also. Prices have remained very steady, however, on the basis of 25¢ @ 25½¢ for prime crude and 29¢ @ 29½¢ for prime Summer Yellow, owing to comparatively moderate receipts at this point.

Miscellaneous.—No change has taken place in the market for any class of Fish Oils, and business is at present almost wholly of a jobbing nature. Cocoanut and Olive Oils have moved fairly at old prices. Mineral Oils have had slightly better sale, but remain without change in value.

Spirits Turpentine.—Reports from the South state that liberal exports and free home trade deliveries have reduced supplies there greatly, and prices have undergone quite a sharp advance. In the New York market values have moved sympathetically, although sales show little increase, and 40¢ @ 40½¢ is now considered as being close value for round lots.

The Marlin Repeating Rifle, Model 1891, 32 Caliber.

The Marlin Fire Arms Company of New Haven, Conn., expect to have ready for shipment early in March a new repeating rifle, as shown in Fig. 1, using in the same arm the 32 short rim and center fire, and 32 long rim and center fire cartridges. The rifle is sent out from the factory with two firing pins, one center and the other rim fire, both of which are plainly marked. These firing pins can be interchanged by any one without the use of tools. The rifle is to have the same system as that introduced last year by this company in their 22 calibre, with the exception of the loading device, which is as follows:

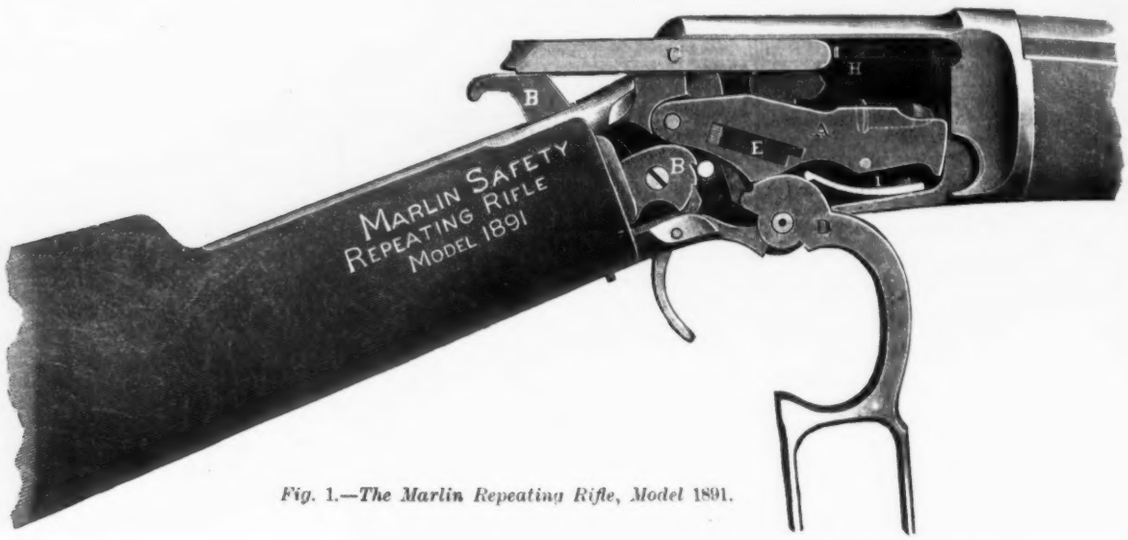


Fig. 1.—The Marlin Repeating Rifle, Model 1891.

In filling the magazine, the operator takes hold of the magazine tube at the end, pressing in the magazine tube catch with the thumb and at the same time drawing the magazine tube straight out until the loading hole is open. The cartridges are dropped in and the tube closed down. The cartridges are loaded directly into the inside tube, which, it is stated, obviates jamming when the outside tube is pushed down after filling the magazine. The outside tube is automatically held in position both when open and closed. When the arm is in use the loading hole is covered. The magazine will hold 18 short rim fire, 17 short center-fire or 15 long either rim or center fire cartridges. One additional cartridge can be carried in the chamber if desired. The point is made that this ammunition is cheap and as compared with repeaters using the 32-20 or 32 W. C. F. cartridges, will save the entire cost of the rifle on the first 2000 or 3000 cartridges.

Fig. 2.—Side Plate.

In the Marlin Repeater the unscrewing of the thumb screw on the right-hand side of the action allows the entire side of the receiver to be removed, Fig. 2, and also in turn the carrier block, finger lever and breech bolt. From the breech bolt may be taken the firing pin and extractor; all this without any tools whatever. This allows the action to be thoroughly cleaned without trouble or tools, and allows the barrel to be wiped out from the breech, which is very desirable in a small-bore gun, and if the action becomes clogged, one minute is sufficient time to open the gun and remove the obstruction. The statement is made that it is the only repeater that can be cleaned without tools.

The manufacturers particularly recommend the repeater to the farmer as an all-round rifle, combining the many good points of the muzzle-loading squirrel rifle with the convenience, cheapness, rapid fire, &c., of the most improved system of repeaters; and, it is added, the short cartridges are just the thing for small game and the long ones for killing hogs or beef very handily. It can be used with short cartridges where a 32-20 would be dangerous. It is remarked that if the operator throws his shells away it is desirable to use rim-fire cartridges, as they are just as good and cheaper. If one wishes to reload his shells the use of center-fire cartridges is recommended.

This rifle can be used as a single shot with the greatest of facility. It is only necessary to drop the cartridge into the receiver when the action is opened and closed with the lever. It is stated that

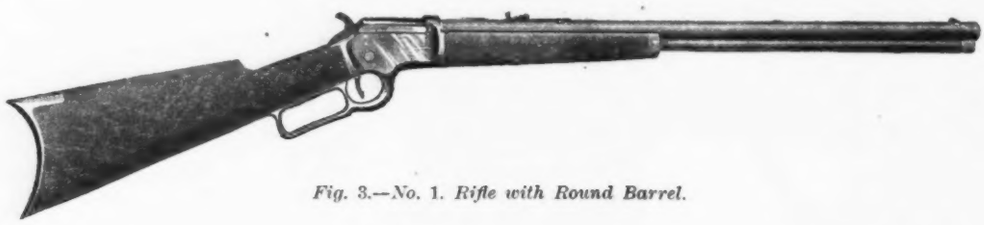


Fig. 3.—No. 1. Rifle with Round Barrel.

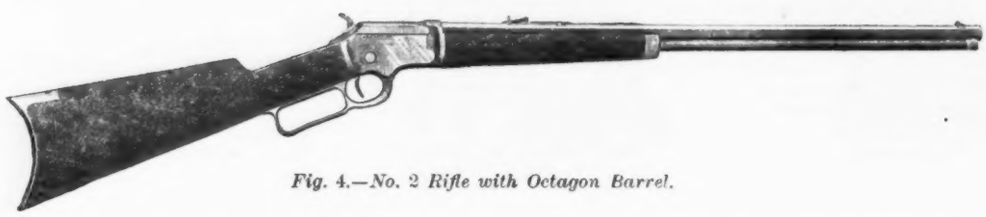


Fig. 4.—No. 2 Rifle with Octagon Barrel.

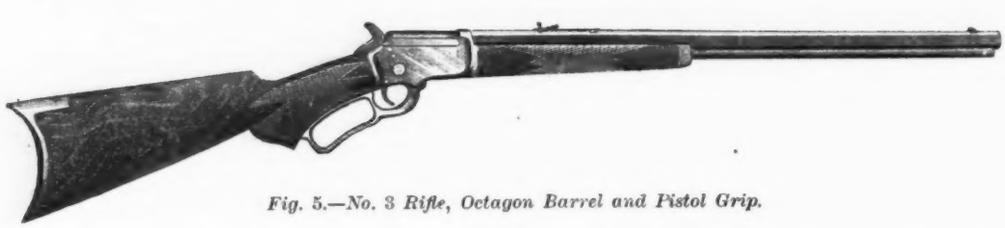


Fig. 5.—No. 3 Rifle, Octagon Barrel and Pistol Grip.

the barrels used are exactly the same as used for years in the Ballard rifles. They are rifled deep, and it is claimed will not foul as quickly as barrels not rifled as deep. This also adds to the life of the barrel, as they will not become shot out as quickly. The manufacturers state that the accuracy of these barrels has been a standard of excellence for years.

This rifle is operated by a finger lever, and any one using this system for home practice will find, it is stated, such practice to be a great help instead of a positive detriment, when he goes into the woods with his larger caliber and finds himself in the presence of game or danger. The throat of the lever is very short and the manipulation remarkably easy. The solid top and side ejecting principle, introduced in their model of 1889, is retained in this arm. It is claimed that the model and style of these rifles is elegant, the fit perfect and the finish unsurpassed. The breech mechanism is very simple and will stand, it is stated, any strain that can be put upon it. The rifles are made in three styles, as shown in Figs. 3, 4 and 5, having round or octagon barrels, and octagon barrel with pistol grip.

Frigorific Ice Pitcher.

Manhattan Silver Plate Company, Lyons, N. Y., and 23 John street, New York, are offering the trade a new cooling device, as shown in the accompanying illustrations. Fig. 1 shows the exterior of one of the styles of pitchers in which the frigorific fount is used, while in Fig. 2 the pitcher is cut away to show the fount. The fount is an air-tight cylinder running through the center of the pitcher in which the ice is placed, thus preventing it from coming in contact with the water. It is stated that if the cylinder is filled with ice in the morning that it will last all day, consequently being not only healthful, but economical. Attention is called to the fact that the many diseases prevalent during the summer months have been traced to the drinking of iced water which had been contaminated by impure ice, which can now be prevented and the cooling beverage still enjoyed by using a pitcher with the fount attachment. The pitchers are made in six styles and sizes, the style shown in Fig. 1 being known as No. 1105, embossed.

Fig. 1.—Frigorific Ice Pitcher.

Fig. 2.—Showing Frigorific Fount Attachment.

A dispatch from Boston says that the United Brotherhood of Carpenters throughout the country will, on May 1, demand that eight hours constitute a day's work, and will strike where the concession is not made.

Eagle Safety for 1892.

The Eagle Bicycle Mfg. Company, Torrington, Conn., are offering the Eagle Safety, as illustrated herewith. The manufacturers state that these wheels are strictly high grade, and are built in the best manner possible, both in quality of materials and finish, the metal parts being all either forged or drawn steel, no cast metal of any kind being used; the forgings are bored out for lightness, not an ounce of unnecessary metal allowed to remain where it is not needed for strength. The form of the frame is referred to as simple and strong, and as designed to give the greatest strength with the least weight and number of parts. It is remarked that the steering is remarkably steady; that much care has been taken in ascertaining the correct amount of rake and curve of forks to produce this result, and that both the cushion and pneumatic machines will be found to steer very easily hands off.

Attention is called to the following points made regarding the construction of these wheels.

No cast steel, cast iron, aluminum bronze or brass is used in their construction; sprocket wheels and all joints of the machine are Bessemer steel, drop forged; tubing is weldless steel, drawn smooth inside and out; spokes are cold swaged to size by a new process which adds to their strength and toughness; wheels are 30-inch front and 28-inch rear, the front wheel has 32 direct spokes, the rear wheel 40; spokes are screwed firmly into the hub flanges and adjusted at the rim by extra long steel nipples; cranks are detachable, throw 5½ to 6½; ball bearing to head, crank shaft, pedals and both wheels;

Eagle Safety for 1892.

distance between centers of ball bearing in head, 7½ inches; distance between centers of ball bearings in crank shaft, 4 inches; all parts are either fitted mechanically or brazed; no soft solder is used to hold bearing cases in place.

The roller chain used is finely polished and fully nickeled, and the machines are furnished with either Tillinghast or Thomas pneumatic tires. When cushion tires are used they are made of 1½-inch section pure gum rubber, which, it is stated, will float on water. The point is made that pure gum rubber floats, adulterated rubber does not. The manufacturers claim that the Eagle cushion tires are almost equal to pneumatics, both in size and elasticity, and are guaranteed in every respect. A fully equipped road machine weighs 44 pounds, but can be stripped down to 37 by dispensing with mud guards and brake, changing saddle, pedals, &c.

Imports.

Hardware, Machinery, &c.

Aich, Hermann, Iron Pots, 117
Baldwin, Chas., Bros. & Co., Gun Barrels, cs., 19
Boker, Hermann & Co., Chains, cks., 27; Ironware, cs., 10; Arms, cs., 5; Iron Chains, cks., 11
Claflin, H. B. & Co., Mach'y, cs., 13
Downing, R. F. & Co., Gun Barrels, cs., 3
Friedheim & Co., Ironware, cs., 61
Frowen, Morton, Mach'y, cs., 6
Frowenfeld, J., Mach'y, case, 1
Goodwin's Sons, Samuel, Gun Barrels, cs., 5
Gambrinus Brewing Co., Mach'y, cs., 10
Graef Cutlery Co., Cutlery, cs., 3
Honduras Line, Anchors, 20; Chains, 20; Wire, reels, 20
Jordan, A. J., Old Mach'y, pgs., 7
Lengerke, Van & Detmold, Arms, case, 1
Markt & Co., Coffee Machines, 2; Hdw., case, 1
Northern Pacific Railroad, Hdw., case, 1
Petzold, L. B., Mach'y, pgs., 3
Pariser, B., Ironware, cs., 5
Pim, Forwood & Co., Sugar Press, 26; Nails, kegs, 25; Gates, crates, 20
Sorter, Mayer & Co., Mach'y, case, 1
Strauss, A. & Co., Hdw., cs., 3
Stoddard, Lovering & Co., Mach'y, cs., 8
Topken & Co., Hdw., cs., 2
Walter, N. C., Mach'y, cs., 3
Werlemann, H., Arms, cs., 5
Wiebusch & Hilger, Arms, cs., 10
Witte, John G. & Bro., Mdse., case, 1

The publication of the *Canadian Magazine of Science* of Montreal has been discontinued.

CURRENT HARDWARE PRICES.

FEBRUARY 24, 1892.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers, at the figures named.

Adjusters, Blind.
Domestic.....₩ doz $3.00, 33⅓%
Excelsior.....₩ doz $10.00. ..50&10&2%
North's .....list net @10%
Zimmerman's—See Fasteners Blind.

Ammunition—See Caps, Cartridges, Shells, &c.

Anvils.
Eagle Anvils, ₩ ℔ 10¢.....15@15&5%
Peter Wright's .....11@11½¢
Trenton .....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—
Millers Falls Co., $18.00.....20%
Chenev Anvil and Vise.....25%
Allen Anvil and Vise, $3.00.....40&10%
Star.....45&5%

Apple Parers—See Parers, Apple, &c.

Augers and Bits—
Douglass Mfg. Co.
Wm. A. Ives & Co.
Humphreysville Mfg. Co.
French, Swift & Co. (F. H. Beecher, P. S. & W. Co.
Rockford Bit Company.
} 70&10@70 &10&5%
Cook's, Douglass Mfg. Co.....55%
Cook's, N. H. Copper Co.50&10@50&10&5%
Ives' Circular Lip 60%
Patent Solid Head.....30%
C. E. Jenning & Co., No. 10, extension lip 40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32⅓ quarters, No. 5, $5; No. 30, $5.50.20%
Lewis' Patent Single Twist.....45%
Russell Jennings' Augers and Bits.25&10%
Imitation Jennings' Bits.....60@60&10%
Pugh's Black 20%
Pugh's Jenning's Pattern.....4 ₩
Car Bits.....60@60&10%
Car Bits, P. S. & W. Co.....60&10%
Snell's Car Bits 60%
L Hommodieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....20%
Cincinnati Bell-Hangers' Bits....30&10%

Bit Stock Drills—
Morse Twist Drills .....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—
Clarks' small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz $60.....40%
Swan's 40%
Steer's, No. 1, $26; No. 2, $22.....35%
Stearns' No. 2, $48.....20%

Gimlet Bits—
Common .....₩ gross $2.75@$3.25
Diamond .....₩ doz $1.10.....25&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co ...30&10%
Double Cut, Hartwell's, ₩ gro.....$5.25
Double Cut, Douglass' .....40&10%
Double Cut, Ives'..... .....60@60&10%

Hollow Augers—
Ives .....
French, Swift & Co.....
Douglass' .....
} 33⅓@ 33⅓&10%
Bonney's Adjustable, ₩ doz $48....40&10%
Stearns' .....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's .....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—
L'Hommedieu's.....15&10@15&10&5%
Watrous'.....15&10@15&10&10%
Snell's .....15&10@15&10&5%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10@5%

Awl Hafts—See Hafts, Awl.

Awls—
Awls, Sewing, Common . ₩ gr. 85@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35@38¢
Awls, Shouldered Brad..₩ gr. $1.30@1 40
Awls, Handled Brad...₩ gr.$2.50@$3.00
Awls, Handled Scratch..₩ gr.$4.0@4.50
Awls, Socket Scratch..₩ doz.$1.10@$1.20

Awl and Tool Sets—See Sets, Awl and Tool.

Axes—

	Plain.	Beveled.
First quality, best brands.	$7.00 @	$7.50
First qual., other brands	6.62½ @ 6.75	
Second quality.....	6.00	6.50

Axle Grease—See Grease, Axle.

Axes—
No. 1...3½@4½¢, No. 2, 3½@4½¢
Nos. 7 to 14..... 6 &10%
Nos. 15 to 18.....47½% } 3% cash
Nos. 19 to 22.....70% }
Concord Axles, loose collar..... 4 40@6¢
Concord Axles, solid collar..... 6½@7¢
National Tubular Self-Oiling..... 33⅓%@33⅓&5%

Bag Holders.—See Holders, Bag.

Balances—
Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ dos....	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See Wire, Barb.

Bars.
Crow—
Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—
Standard Fiberware, No. 1, 10½-inch, $2; 12-inch, $2.25; 13½-inch, $2.75; 15-inch, $3.25.

Beams, Scale—
Scale Beams, List Jan. 12, '82...50&10@ 50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—
Egg—
Dover.....₩ doz $1.50
Duplex (Standard Co.).....₩ doz $1.25
Rival (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)... ₩ doz $3.50
Bryant's.....₩ gro $14.00
Double (H. & R. Mfg. Co.), ₩ gro. No. 0, $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral .....₩ gro $4.25 @ 4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro $9.00
Paine, Diehl & Co.'s.....₩ gro $24.00
Silver & Co .....₩ doz $5.50
Culinary—
Keystone, P.D.&C., Each, No. 1, $1; No. 2, $2.....20 %

Bells—
Cow—
Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky.....70&70&10%
Texas Star.....50&10@50&10&5%
Door—
Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Taylor's.....25&10%
Crank Brooks'.....50&10&2%
Crank Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned .....25&10%
Lever, R. E. M. Co's.....50&10&2%
Pull, Brook's..... .....50&10&2%
Electric,
Wollensak's.....20%
Bigelow & Dowse.....20%
Taylor's 20%
Hand—
Light Brass.....70&10%
Extra Heavy.....70
White 70%
Silver Chime.....33⅓&10%
Globe Cone's Patent) .....25&10&35%
Miscellaneous—
Call.....40@40&5%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—
Blacksmiths'..... 60&10 &60&10&5%
Molders'.....40&10&5%
Hand Bellows.....40&10@50%

Belting, Rubber—
Common Standard.....70@70&10&5%
Standard.....70@70&5%
Extra.....60@60&10%
N.Y.B.&P.Co., Carbon.....60%
N.Y.B.&P.Co., Diamond..... .....50%
N.Y B.&P.Co., Para.....40%

Bench Stops—See Stops, Bench.

Benders and Upsetters, Tire.
Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%

Bits—
Auger, Gimlet, Bit Stock Drills, &c., see Augers and Bits.

Bit Holders—See Holders.

Blind Adjusters—See Adjusters, Blind.

Blind Fasteners—See Fasteners, Blind.

Blind Staples—See Staples, Blind.

Blocks—
Ordinary Tackle, list May 20, 1889... See Trade Report
Cleveland Block Co., Mal. Iron.....50%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%

Boards, Stove.
Wood Lined Crystal.....50%
Oxidized 45%
Embossed.....50%
Paper Lined Zinc.....55%
Crystal.....55%
Embossed.....55%
New Tacoma.....55%

Bolts—
Carriage, Machine, &c.—
Com. list June 10, '84.....75&10&2%
Genuine Eagle, Norway, list Oct., '84... 80@80&10%
Phila. pattern, list Oct. 7,'84..75@75&10%
R.B.&W., old list 70%
Machine, list Jan. 1, 1890..... 80@80&5%
Bolt Ends, list Jan. 1, 1890..... 75&10@75&10&5%
Door and Shutter—
Cast Iron Barrel, Square, &c..70@70&10%
Cast Iron Shutter Bolts.....70@70&10%
Cast Iron Chain (Sargent's list)...65&10%
Ives' Patent Door Bolts 60&10@60&10&5%
Wrought Barrel.....70@70&10%
Wrought Square.....70@70&10%
Wr't Shutter, all Iron, Stanley's..60&10%
Wr't Shutter, Brass Knob, " ..40&10%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....55&10%
Wr't Sunk Flush, Stanley's list....50&10%
Wr't B.K.Flush, Com'n " ....55&10%

Stove and Plow—
Stove.....60%
Plow.....60&5%
B. B. & W., Plow.....55%

Tire—
Common, list Feb. 28, '83.....65%
Port Chester Bolt and Nut Company:
Empire, list Feb 28, '83.....65%
Keystone, Philadel., list Oct. '84....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phil., list Oct. 16, '84.....75%
Eagle, Phil., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R.B.&W., Philadel., list Oct. 16, '84....80%

Borers, Tap.
Common and Ring.....20&10%
Ive's Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20&10@30%
Clark's.....33⅓@35%

Borax.....₩ ℔ 9½@10½¢

Boring Machines—See Machines, Boring.

Bow Pins—See Pins, Bow.

Boxes, Wagon.
Per ℔.....2½¢

Braces.—
American Bit Brace Co.:
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5%
Ball Braces, net .....$1.12 to $1.25
Amidon's
Barker's Imp'd Plain.....75&10 @80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Rachet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.1
Barber's,
Nos. 10 to 16.....50@50&10%
Nos. 30 to 33.....50@50&10%
Nos. 40 to 63.....50&10@50&10&5%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's..50&5@50&10%
Fray's No. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barbers.....60&5%
Spofford.....60&5@60&10%
Osgood's Ratchet.....40&10@50%
P. S. & W. Co., Peck's Patent.....60%

Brackets—
Shelf, plain.
Regular list.....65@70%
Sargent's list.....66⅔@66⅔&10%
Shelf, fancy.
Sargent's list.....66⅔@66⅔&10%
Other makes at a widerange of prices.

Bright Wire Goods—See Wire.

Broilers—

Henis' Self-	Inch.....	9	10	9x11
Basting.	Per doz...	$4.50	5.50	6.50

New Haven..... 50%
Wire Goods Co .....65&10%
Morgan Odorless.....₩ doz $12, 33⅓%

Buckets, Well.
Galvanized—
Hill's.....₩ doz, 12 qt, $4.25; 14 qt, $5.2.
Iron Clad.....₩ doz. 14 qt, $4.25@$4.5
Heiwig's Flat Iron Band.....$3.7
Heiwig's Wired Top.....₩ doz $4.00

Bull Rings—See Rings, Bull.

Butchers' Cleavers—See Cleavers Butchers'.

Butts—
Brass—
Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%
Cast Iron—
Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....60&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} ..70&10 @75%
Wrought Steel—
Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c ....
Inside Blind, Regular.....
Inside Blind, Light.....
Loose Pin.....
} .70&10 @75%
Bronzed Wrought Butts.....50%

Calipers—See Compasses.

Calks, Toe—
Gautier, One Prong, Blunt.....6½@6¢
Burke's, One Prong, Blunt.....6½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See Openers Can.

Caps—
Percussion, ₩ 1000—
Hicks & Goldmark's and Union Metallic Cartridge Co.
F. L. Waterproof, 1-10's.....32@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's..... 47@50¢
Musket Waterproof, 1-10's.....50@55¢
G. D.....37@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....55¢ @ 55¢
Eley's D Waterproof, Central Fire....$1.00
Primers—
Berdan Primers, $1.00.....2%
U. L. Caps (for Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Cards—List January 28, 1891.
Watson's Cotton, Wool, Horse and File. 2%

Carpet Stretchers—See Stretchers Carpet.

Carpet Sweepers—See Sweepers Carpet.

Cartridges—
Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% on above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
U. B. Caps, Round Ball, $1.75.....2%
U. B. Caps, Con. Ball, Swgd., $2.00.....2%

Casters—
Bed.... } Brass....55&55&10%
Plate.... } Others...60@60&10%
Shallow Socket.....
Deep Socket.....40&10%
Yale Casters, list May, 1884...30&10@40%
Yale, Gem.....60@60&5%
Martin's Patent (Phœnix).....45&10@50%
Parson's Anti-friction.....70%
Parson's Truck.....60%
Giant Truck Casters.....30%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50%

Cattle Leaders—See Leaders, Cattle.

Cement.
Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—
Trace, Wagon and Fancy Chains, List revised April 21, 1890.....60@ 60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.45	4.45	3.80	3.65	3.50	3.40	3.35

Less than cask lots, add ½¢@¾¢ ₩ ℔.
German Coil, list Oct. 6, 1890...60@60&5%
German Halter Chain, list Oct. 6, 1890 60@60&5%
Covert Halter.....60@2%
Covert Traces.....35@2%
Covert Heel Chain .....50@2%
Oneida Halter Chain.....60@60&5%
Galvanized Pump Chain.....₩ 5½@6¢
Jack Chain, Iron.....75&10@80%
Jack Chain, Brass.....75@75&10%

Chalk—
White, case lots, ₩ gr 50¢; small lots 55 @55¢
Red, case lots...₩ gr 67¢; small lots 77 @78¢
Blue, case lots...₩ gr 75¢; small lots 85¢
See also Crayons.

Chalk Lines—See Lines.

Chisels—
Socket Framing and Firmer.
P. S. & W.....
New Haven.....
Witherby.....
Mix.....
Ohio Tool Co.....
} ..75 @ 75&10%
Douglass.....75@75&5%
Buck Bros.....30%
Merrill.....60&10@60&10&5%
L. & I. J. White.....30@30&5%
Tanged and Miscellaneous.
Tanged Firmers.....40&10@50%
Butchers'.....$4.75@$5.00
Spear & Jackson's.....$5 to $
Buck Bros.....30%
Cold Chisels, ₩ ℔.....15@16¢

Chucks—
Beach Pat.....each, $8.00.....20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury.....each, $6.00, 30@30&5%
Syracuse, Bals Pat.....25%
Graham Patent.....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks.....33⅓%
Universal Lathe Chucks.....40%
Independent Lathe Chucks.....40%
Drill Chucks.....15%
Union Mfg. Co.,
Victor.....$8.50, 2%
Combination.....40%
Universal.....40%
Independent.....40%

Churns.
Tilton Union, each, 5 gal. $3.25; 7 gal. $3.75; 10 gal. $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75 15 gal. $3.00 20 gal., $3 ??

CHAIRMAN AND GUESTS.

Crockery Board of Trade
Jonathan H. Crane

Wholesale Grocers' Association
G. Waldo Smith

Produce Exchange
Evan Thomas

Marcus C. Hawley

George H. Sargent

Samuel A. Haines

William H. McElroy

David Williams

Hon. David H. Goodell

Hon. Edward Cooper

Mahlon J. Woodruff

Rev. A. J. F. Behrends, D.D.

Rev. James M. Buckley, D.D., LL.D.

Webster R. Walkley, *Chairman*

Hon. Abram S. Hewitt

Hon. Joseph B. Sargent

Hon. William J. Coombs

William W. Supplee

Richard R. Williams

Fayette R. Plumb

William H. Williams

Charles A. Moore

Francis B. Thurber

David M. Stone

John C. Tucker

Archibald P. Mitchell

TABLE A.

Canton Hardware Co. J. B. Brothers	1	2	Topping & Fox John Bertram
C. H. Dodd & Co. C. H. Dodd	3	4	The Metal Worker A. O. Kittredge
The Iron Age F. E. Thompson	5	6	The Metal Worker L. C. Dawes
The Iron Age John S. King	7	8	The Iron Age D. L. Williams
The Iron Age W. C. English	9	10	The Iron Age H. M. Williams
The Iron Age D. J. Scully	11	12	The Iron Age Thomas Hobson
The Metal Worker Henry Colwell	13	14	John C. Tucker
W. Witte	15	16	Van Wagoner & Williams Co. J. J. Teeple
J. H. Lau	17	18	C. W. Dunlap
Plume & Atwood Mfg. Co. R. H. Swayze	19	20	Marten Doscher
W. H. Jacobus	21	22	P. & F. Corbin
Humason & Beckley Mfg. Co. V. P. Humason	23	24	Howe Scale Co. W. C. Page
J. F. McCoy Co. J. F. McCoy	25	26	W. I. Negus
Asline Ward	27	28	Hardware T. W. Moorhead
James McCaughn	29	30	Hardware W. L. Martin
Hardware O. D. Gray	31	32	Hardware & Metal Review J. F. Clark
Hardware & Metal Review W. H. Fowler	33	34	Hardware and Metal Review G. S. Atkins
Hardware & Metal Review J. R. Stevenson	35	36	American Axe and Tool Co. C. W. Hubbard
American Axe & Tool Co. W. T. Norton	37	38	American Axe and Tool Co. G. T. Lane
American Axe & Tool Co. E. D. Eager	39	40	American Axe and Tool Co. J. H. Mann
Bradley & Smith	41	42	A. B. Cohn
Bradley & Smith	43	44	A. F. Brombacher & Co. A. F. Brombacher
Central Stamping Co.	45	46	Central Stamping Co.
Central Stamping Co.	47	48	Central Stamping Co.

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Central Stamping Co.
D. H. James

TABLE B.

Dunham, Carrigan & Hayden Co. Bruce Hayden	1	2	
Kearney & Foot Co. J. D. Foot	3	4	
Charles Morrill	5	6	
Belcher & Loomis Mr. Belcher	7	8	
Church & Sleight Mr. Sleight	9	10	
A. E. Tenney & Co. A. E. Tenney	11	12	
M. W. Robinson	13	14	
C. E. Jennings & Co. C. E. Jennings	15	16	
C. E. Jennings & Co. H. H. Mayhew	17	18	
C. E. Jennings & Co. J. D. Swinton	19	20	
C. E. Jennings & Co. George Griffin	21	22	
C. E. Jennings & Co. J. L. Jennings	23	24	
Amer. Needle & Fish Hook Co. John S. Hull	25	26	
Alford & Berkele Co. Alonzo Alford	27	28	
Voight, Starr & Co. W. A. Voight	29	30	
Woodey, Baymon & Moore C. A. Baymon	31	32	
Ellrich Hdw. Co. T. A. Barnes	33	34	
Jno. Simmons Co. Jno. Simmons	35	36	
Meriden Cutlery Co. Mr. Collins	37	38	
Meriden Cutlery Co. Homer A. Curtiss	39	40	
J. Russell Cutlery Co. Alexander Rowland	41	42	
J. Russell Cutlery Co. Albert E. Dustin	43	44	
Haydock & Bissell Frank Van Name	45	46	
Haydock & Bissell H. R. Haydock	47	48	

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Haydock
Enge

TABLE E.

Landreth H. King	1	2	W. H. Belcher
Hezekiah King	3	4	F. T. Witte Hdw. Co. R. Lienhart
F. T. Witte Hdw. Co. F. T. Witte	5	6	Chadborn & Coldwell Mfg. Co. E. T. Smith
Wiebusch & Hilger C. F. Wiebusch	7	8	Chadborn & Coldwell Mfg. Co. C. H. Halstad
H. W. Merrill	9	10	C. F. Guyon Co. T. W. Munroe
Underhill, Clinch & Co. Henry Luhrs	11	12	C. J. Stebbins
Ames Plow Co. L. A. Pratt	13	14	Huntington-Hopkins Co. S. H. Groser
Underhill, Clinch & Co. H. H. Groshong	15	16	Sargent & Co. G. F. Wiepert
Clinton Wire Cloth Co. Geo. E. Howard	17	18	Turner, Day & Woodworth Mfg. Co. W. R. McCullough
Richardson Bros. F. B. Earle	19	20	C. J. Bliven
Underhill, Clinch & Co. E. A. Tissot	21	22	X. Stoutenborough
C. E. Jennings & Co. F. B. Griffin	23	24	Branford Lock Works A. L. Runyon
C. F. Guyon Co. C. F. Guyon	25	26	A. Field & Co. Robert Pearsall
W. E. Pruden	27	28	A. Field & Co. Wm. C. Leary
E. G. Shepard	29	30	A. Field & Co. Walter Sanders
A. Field & Co. Frank Clatworthy	31	32	Snell Mfg. Co. W. K. Wilson
A. Field & Co. A. H. Saxton	33	34	Eagle Lock Co. R. J. Plumb
Livingston Horse Nail Co. S. Otis Livingston	35	36	Sherman & Lyon A. G. Sherman
Eagle Lock Co. M. C. Ogden	37	38	Eagle Lock Co. H. B. Plumb
Huntington-Hopkins Co. Charles Miller	39	40	Southington Cutlery Co. H. D. Platt
Underhill, Clinch & Co. W. W. Glover	41	42	Nicholson File Co. W. T. Nicholson
Brass Goods Mfg. Co. W. F. Hyatt	43	44	Underhill, Clinch & Co. Edgar Underhill
Sargent & Co. T. J. Atkins	45	46	American Screw Co. J. A. Nealey
Chadborn & Coldwell Mfg. Co. L. M. Smith	47	48	Sargent & Co. George Munson

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Underhill, Clinch & Co.
A. D. Clinch.

TABLE F.

Yale & Towne Mfg. Co. H. R. Towne	1	2	Yale & Towne Mfg. Co. T. F. Keating
Yale & Towne Mfg. Co. W. F. Donovan	3	4	Landers, Frary & Clark
Miller, Sloss & Scott A. W. Milligan	5	6	Bogardus, Ellaby & Elsworth J. H. Bogardus
John Colby	7	8	Edwards & Walker Frederick Walker
Dunham, Carrigan & Hayden Co. R. H. Milligan	9	10	Thomas E. Oliver
Miller, Sloss & Scott Thomas Laing	11	12	R. K. Carter & Co. F. R. Blauvelt
Travers Bros. F. C. Travers	13	14	Hawley Bros. Hardware Co. F. J. Oliver
W. R. Grace & Co. P. LaCoste	15	16	Travers Bros. V. P. Travers
R. K. Carter & Co. R. K. Carter	17	18	A. E. Dietz
Enterprise Mfg. Co. of Pa. T. H. Asbury	19	20	J. C. McCarty & Co. W. H. Littell
J. C. McCarty & Co. J. C. McCarty	21	22	J. C. McCarty & Co. G. B. McCarty
Coes Wrench Co. Loring Coes	23	24	C. F. Furnald
Robert McCarthy & Son Robert McCarthy	25	26	Enterprise Mfg. Co. of Pa. C. H. Asbury
J. H. Graham & Co. W. A. Graham	27	28	Coes Wrench Co. John H. Coes
Henry Disston & Sons Samuel Disston	29	30	J. H. Graham & Co. J. H. Graham
J. H. Graham & Co. G. A. Graham	31	32	Henry Disston & Sons Hamilton Disston
New Departure Bell Co. A. F. Rockwell	33	34	McKinney Mfg. Co. L. E. Hansen
J. H. Graham & Co. I. O. Graham	35	36	Russell & Erwin Mfg. Co.
Landers, Frary & Clark C. S. Landers	37	38	Russell & Erwin Mfg. Co. G. J. Laighton
Russell & Erwin Mfg. Co. G. B. Germond	39	40	Landers, Frary & Clark C. L. R. Clark
Landers, Frary & Clark C. F. Smith	41	42	Russell & Erwin Mfg. Co. W. G. Smythe
Weed & Co. Hobart Weed	43	44	T. Rowland's Sons Howard Rowland
Stanley Works G. P. Hart	45	46	Stanley Works I. G. Lawrence
Stanley Works L. H. Pease	47	48	Stanley Works A. Chamberlain

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Stanley Works
Peter McCartee

TABLE B.

2	Maltby, Henley & Co. D. F Maltby		
4	Maltby, Henley & Co. J. Henley		
6	National Saw Company R. L. Woodrough		
8	National Saw Company H. C. Marshall		
10	National Saw Company John Presson		
12	National Saw Company H. Woodrough		
14	National Saw Company Harry Disston		
16	The Iron Age C. C. Talmer		
18	Charles Parker Co. W. H. Lyon		
20	Dunham, Carrigan & Hayden Co. R. H. Hopkins		
22	D. T. Mallett & Co. D. T. Mallett		
24	Coldwell Lawn Mower Co. L. M. Coldwell		
26	The Iron Age Thomas Atkinson		
28	J. P. Lovell Arms Co. Col. B. S. Lovell		
30	Gen'l Augustus Gaylord		
32	A. F. Bannister & Co. A. F. Bannister		
34	J. T. Mount & Co. J. T. Mount		
36	H. L. Judd & Co. John Day		
38	Van Wagoner & Williams		
40	J. Curley & Bro. J. Curley		
42	Lamson & Goodnow Mfg. Co. W. A. Willard		
44	J. Russell Cutlery Co. W. P. Dustin		
46	Haydock & Bissell Eugene Bissell, Jr.		
48	Friend P. Fitts		
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Haydock & Bissell
Eugene Bissell

TABLE C.

Brooklyn Eagle	1	2	Standard Union
N. Y. Herald	3	4	N. Y. Times
N. Y. World	5	6	N. Y. Sun
Mail and Express	7	8	Evening Post
N. Y. Tribune	9	10	Morning Advertiser
The Iron Age	11	12	The Iron Age
Smith, Lyon & Field	13	14	The Iron Age A. J. Barnett
Smith, Lyon & Field	15	16	Smith, Lyon & Field
Smith, Lyon & Field	17	18	Smith, Lyon & Field
Topping & Fox G. E. Haunas	19	20	W. Dodman
Topping & Fox H. G. Atha	21	22	Topping & Fox W. H. Fox
Topping & Fox J. P. Topping	23	24	Topping & Fox H. Halliday
A. B. & W. T. Westervelt W. T. Westervelt	25	26	Topping & Fox F. W. Blossom
American Wringer Co. Jos. Banigan	27	28	American Wringer Co. R. C. Browning
American Wringer Co. Geo. Reuter, Jr.	29	30	American Wringer Co. Lyman A. Mills
American Wringer Co. J. F. Hemenway	31	32	American Wringer Co. A. G. Beardsley, Jr.
W. H. Quinn	33	34	The Union Nut Co. L. F. Tissot
The Union Nut Co. J. L. Dill	35	36	The Union Nut Co. F. S. Pownall
The Union Nut Co. L. L. Ensworth	37	38	The Union Nut Co. I. S. Ventres
The Union Nut Co. Thaddeus Smith	39	40	The Union Nut Co. J. B. Clapp
The Union Nut Co. S. L. Way	41	42	The Union Nut Co. Sam'l J. Johnson
Miller's Falls Co. E. P. Stoughton	43	44	The Union Nut Co. L. J. Huking, Jr.
Miller's Falls Co. Geo. E. Rogers	45	46	The Union Nut Co. J. C. Pealody
The Union Nut Co. J. A. Van Winkle	47	48	The Union Nut Co. E. B. Sheffer
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The Union Nut Co.
J. L. Varick

TABLE D.

Peck, Stow & Wilcox Co. Winfield D. Walkley	1	2	Sickels, Sweet & Lyon Robert Sickels
Biddle Purchasing Co. William C. Biddle	3	4	Buehler, Bonbright & Co. James S. Bonbright
Joseph E. Rhodes	5	6	Biddle Purchasing Agency W. C. Shields
Peck, Stow & Wilco Co Edward , Darville	7	8	Peck, Stow & Wilcox Co. S. Howard Wilcox
Peck, Stow & Wilcox Co. Hon Stephen Walkley	9	10	Thomas T. Miller Hardware Co. Frank C. Miller
Plumb, Burdict & Barnard Ralph H. Plumb	11	12	Peck, Stow & Wilcox Co. Elisha J. Neale
Hoopes & Townsend James M. Hibbs	13	14	Southington Cutlery Co. J. W Gridley
American Dash Co. I. Cryder Lea	15	16	American Curry Comb Co. Wm. M. Peckham
Sickels, Sweet & Lyon Edwin S. Sweet	17	18	Sickels, Sweet & Lyon Henry M. Lyon
Peck, Stow & Wilcox Co. Charles L. Campbell	19	20	Ætna Nut Co. George B. Finch
Clark Brothers & Co. William B. Cummings	21	22	Goldsmith & Loewenburg Philip Goldsmith
Sickels, Sweet & Lyon	23	24	Packard Hardware Co. John R. Packard
Charles Weiland	25	26	Sickels, Sweet & Lyon
The Iron Age Charles Kirchhoff	27	28	The Iron Age H. C. Mable
Portchester Bolt & Nut Co. Samuel Comley	29	30	Wallace & Sons Sam'l H. Wilson
H. M. Le Count	31	32	Stanley Rule & Level Co. F. H. Thompson
L. D. Frost & Sons E. W. Frost	33	34	James H. Goldey
C. O. Le Count	35	36	The Iron Age E. F. Eilert
Fuller Brothers & Co. George Fuller	37	38	Fuller Brothers & Co. H. W. Fuller
Borden & Lovell L. N. Lovell	39	40	Ausable Horse Nail Co. A. Bussing
James H. Flagg	41	42	Tuttle & Bailey
W. C. Burkinshaw	43	44	Wallace & Sons Sam'l F. Thompson
Wallace & Sons Bernard Rls	45	46	Stanley Rule & Level Co. Charles L. Mead
U. S. Cartridge Co.	47	48	The Iron Age John S. King
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Wallace & Sons
U. T. Hungerford

TABLE G.

Harmon & Dixon G. U. Dixon	1	2	Reading Hardware Co. F. L. Stellwagen
E. C. Stearns & Co. W. B Smith	3	4	Harmon & Dixon H. W. Harmon
Surpless, Dunn & Alder	5	6	E. T. Fraim
J. H. Drake's Sons F W. Drake	7	8	Surpless, Dunn & Alder B. S. Alder
J. H. Drake's Sons	9	10	Bridgeport Brass Co. C. N. Cordier
Salem Wire Nail Co G. H. Ismon	11	12	G. A. Gridley & Son C. H. Gridley
Albany Hardware & Iron Co. C. H. Turner	13	14	Tower & Lyon
Tower & Lyon	15	16	Hartley & Graham
Hartley & Graham	17	18	Schoverling, Daly & Gales Charles Daly
Hardware J. H. Kennedy	19	20	Hartley & Graham
Naylor & Flack Co. C. H. Naylor	21	22	Hardware J. A. Sherman
J. R. Torrey & Co. E. W. Langley	23	24	Stanley & Patterson A. F. Stanley
Clauss Shear Co. W. J. Clery	25	26	American Tool Co J. H. Patrick
L. A. Sayre	27	28	Smith & Egge Mfg. Co. J. J. Halpin
Smith & Egge Mfg. Co. F. W. Smith	29	30	Vom Cleff & Co. Robert Vom Cleff
H. Boker & Co. C. F. Boker	31	32	Vom Cleff & Co. A. N. Kennedy
H. Boker & Co. A. N. Funke	33	34	Vom Cleff & Co. J. H. Tebbenhoff
McLean Bros. & Rigg, Ltd. W. J. Travis	35	36	Anglo American Iron & Metal Co. J. B. Brown
Anglo American Iron & Metal Co. J. Friedenstein	37	38	Union Drawn Steel Co. Thos. Towne
J. G. Speir	39	40	Church & Sleight
G. E. Voorhees	41	42	H. B. Newhall Co. C. L. Phipps
Colwell Lead Co. B. F. Hooper	43	44	Bruce & Cook W. Young
Bruce & Cook S. A. Jennings	45	46	Cooper, Hewitt & Co.
Cooper, Hewitt & Co.	47	48	Bruce & Cook J. C. Charlock
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Bruce & Cook
P. R. Jennings

CHAIRMAN AND GUESTS.

PLAN OF TABLES.

TABLE A

TABLE B

TABLE C

TABLE D

TABLE E

TABLE F

TABLE G

AT SHERRY'S, NEW YORK, FEBRUARY 23, 1892.

Clamps—

R. I. Tool Co.'s Wrought Iron.....25%
Adjustable, Cincinnati.....15&10%
Adjustable, Hammers.....15%
Adjustable, Stearn's.....30@30&10%
Adjustable, Stearn's Adjustable Cabinet and Corner.....30@30&10%
Cabinet, Sargent's.....66%&10%
Carriage Makers', Sargent's.....70&10%
Carriage Makers', P., S. & W. Co..40&10%
Eberhard Mfg. Co.....40&5@40&10%
Warner's.....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenters', Cincinnati.....25&10%

Cleavers.

Butchers'.

Bradley's.....25@30%
L. & I. J. White.....20@25%
Beatty's.....40@40&5%
New Haven Edge Tool Co.'s.....40%
P., S. & W.....33⅓&5@33⅓&10%
Poster Bros.....30%
Schulte, Lohoff & Co.....40@40&5%

Clips—

Norway, Axle, ¼ & 5-16.....55&5&5%
2nd grade Norway Axle, ¼ & 5-16. 65&5%
Superior Axle Clips.....60@65&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought-Iron Felloe Clips.....₩ lb, 5¢
Steel Felloe Clips.....₩ lb, 5¢
Baker Axle Clips.....25%

Cloth and Netting, Wire—See Wire, &c.

Cockeyes.....50%

Cocks, Brass.

Hardware list.....50&2½

Coffee Mills—See Mills, Coffee

Collars, Dog, &c.

Medford Fancy Goods Co.....40&10%
Embossed, Gilt, Pope & Steven's list 30&10%
Leather, Pope & Steven's list.....40%
Brass, Pope & Steven's list.....40%
Chapman Mfg. Company.....50&10@50%

Combs, Curry.

Fitch's.....50&10@50&10&10%
Rubber, per doz $10.00.....30%
American Curry Comb Co..New prices in preparation.

Compasses, Dividers, &c.—

Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers.....60&5%
Compasses & Calipers.....50&5%
Wing and Inside or Outside.....50&5%
Double.....60%
(Call's Pat. Inside).....30%
Excelsior.....50%
J. Stevens & Co.'s.....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers.....25%
Combination Dividers.....25%

Coopers' Tools—See Tools, Coopers'.

Cord—

Sash.

Common.....₩ lb, 10¢ @ 11¢
Patent, good quality.....₩ lb, 12 @ 12¢
White Cotton Braided, fair, ₩ lb, 24½@25¢
Common Russia Sash.....₩ lb, 12½@13¢
Patent Russia Sash.....₩ lb, 14¢
Cable Laid Italian Sash.....₩ lb, 21@22¢
India Cable Laid Sash.....₩ lb, 12¢
Silver Lace—
A Quality, White, 50¢.....25 %
A Quality, Drab, 55¢.....25 %
B Quality, White, 30¢.....10 %
B Quality, Drab, 35¢.....10 %
Sylvan Spring, Extra Braided White, 34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White.....30¢
Egyptian, India Hemp, Braided.....26¢
Massachusetts, White.....26¢
Samson—
Braided, White Cotton, 50¢..30@30&5%
Braided, Drab Cotton, 55¢...30@30&5%
Braided, Italian Hemp, 55¢..30@30&5%
Braided, Linen, 80¢.....30@30&5%
Tate's Cotton Braided, White, ₩ lb, 28¢, 10%

Wire Picture.

Braided or Twisted.....75&10%

Corkscrews—See Screws, Cork.

Corn Knives and Cutters—See Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....40%
Blake's Pattern.....₩ doz $2.00, 10%
Turner & Seymour Mfg. Co.....50%

Cradles—

Grain.....50&5&2@50&10&2%

Crayons.

White Crayons, ₩ gross.....10¢
D. M. Stewart Mfg. Co., Metal Workers, ₩ gr, $2.50.....25%
D. M. Stewart Mfg. Co., Rolling Mill, ₩ gr, $2.50.....25%
See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins Curtain

Cutters—

Meat.

Dixon's ₩ doz.....40&5%
Nos.... 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Woodruff's ₩ doz.....40&5%
Nos.....100 150
$15.00 $18.00
Hales Pattern ₩ doz.....70@70&5%
Nos.....11 12 13
$27.00 $33.00 $45.00
American.....30%
Nos..... 1 2 3 4 B 5
Each.....$5 $7 $10 $25 $50 $60
Enterprise.....30%
Nos.....10 12 22 32 42
Each.....$3 $3.50 $4 $6 $15
Great American Meat Cutter.....30%
Nos..... 112 116 118 120 122
Each....$2.00 $2.75 $3.00 $3.50 $4.00
Miles' Challenge ₩ doz.....45@45&10%
Nos.....1 2 3
$22.00 $30.00 $40.00
Home No. ..... ₩ doz $26.00, 5&10%

Draw Cut, each:
Nos..5 2 6 8
$50 $75 $80 $225 .....20@25%
Beef Shavers (Enterprise).....20&10@30%
Little Giant (P. S. & W. Co.).....50%
Chadborn's Smoked Beef Cutter, ₩ doz $66.00

Tobacco.

Champion.....20&10@30%
All Iron.....₩ doz $4.25
Nashua Lock Co.'s..₩ doz, $18.00 50@55%
Wilson's.....55%
Sargents's.....₩ doz, $24, 55&10%
Acme.....₩ doz $20.00, 40%

Washer.

Smith's Pat.....₩ doz $12.00, 20&10&10%
Johnson's.....₩ doz $11.00, 33⅓%
Penny's, ₩ doz Pol. $14; Jap'd, $16.00, 55%
Appleton's.....₩ doz $16.00, 60&10%
Bonney's.....30&10%
Cincinnati.....25&10%

Dampers, &c—

Dampers, Buffalo.....40&10%
Buffalo Damper Clips.....40&10%
Crown Damper.....40%
Excelsior.....40&10%

Diggers, Post Hole, &c.—

Samson Post Hole Digger, ₩ doz $36.00, 25%
Fletcher Post Hole Augers, ₩ doz $36, 20%
Eureka Diggers.....₩ doz $12.50@14.00
Leed's.....₩ doz $8.00@9.00
Vaughan's Post Hole Auger, ₩ doz $13.00@14.00
Kohler's Little Giant.....₩ doz. $18.00
Kohler's Hercules.....₩ doz. $7.50
Kohler' New Champion.....₩ doz. $9.00
Schniedler.....₩ doz. $18.00
Ryan's Post Hole Diggers..₩ doz $24.00
Cronk's Post Bars, ₩ doz $60.00, 50&5&50&10%
Gibbs Post Hole Digger.....₩ doz $15.00
Imperial.....₩ doz $7.50
Shimer's Hollow Handle, ₩ doz, $24..40%

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Door Springs—See Springs, Door.

Drawers.

Money, ₩ doz.....$18&20

Drawing Knives—See Knives, Drawing.

Drills and Drill Stocks—

Blacksmiths'.....each $1.75
Blacksmiths' Self-Feeding, each $7.50,20%
Breast, P. S. & W.....40&10%
Breast, Wilson's.....30&5%
Breast, Millers Falls.....each $3.00, 25%
Breast, Bartholomew's.....each $2.50, 25&10@40%
Ratchet, Merrill's.....20@20&5%
Ratchet, Ingersoll's.....25%
Ratchet, Parker's.....20@20&5
Ratchet, Whitney's.....20&10%
Retchet, Weston's.....20@25%
Ratchet, Moore's Triple Action..35@30%
Ratchet, Curtis & Curtis.....30%
Whitney's Hand Drill, Plain, $11.00; Adjustable, $12.00.....20&10%
Wilson's Drill Stocks.....10%
Automatic Boring Tools.....$1.75@$1.85

Twist Drills—

Cleveland.....50&10&5%
Diamond, W. & B.....50&10&5%
Graham's Pat. Groove Shank 50&10&5%
Morse.....50&10&5%
New Process.....50&10&5%
Standard.....50&10&5%
Syracuse (Metal list).....50&10%

Drill Bits or Bit Stock Drills—

See Augers and Bits.

Drill Chucks.—See Chucks.

Dripping Pans—See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....20@20&10%
Disston's.....60%
Buck Bros.....30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles.....65&10%
No. 80.....70&10%
Sargent & Co.'s
No. 1 Forged Blade.....60&10&10%
Nos. 20, 30 and 60.....60%&10&10%
P. S. & W.....70 %
Knapp & Cowles:
No. 1.....60&20@70%
No. 2.....60&10&10@70&5%
No. 3.....60&5@60&10%
Nos. 4 and 00, Acme and Ideal..50& 5@50&10&5%
Stearns'.....35&10&5%
Gay & Parsons.....35%
Champion.....25&10%
Clark's Pat.....30@33⅓%
Crawford's Adjustable.....30%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list.....25%
Kolb's Common Sense ₩ doz $6.00,25&10%
Syracuse Screw-Driver Bits...30&30&5%
Screw-Driver Bits.....₩ doz. 50@75¢
Screw-Driver Bits, Parr's.....₩ gro $6.25
Fray's Hol. Hdle. Sets. No. 3. $12.00, 25@25&10%
P. D. & Co.'s all Steel.....50%
Cincinnati.....25&10%
Brace Screw Drivers.....25&10%
Buck Bros.' Screw-Driver Bits.....

Egg Beaters.—See Beaters, Egg.

Egg Poachers.—See Poachers, Egg.

Electric Bell Sets.—See Bells, Electric.

Emery.—

	No. 4 to 46 gr.	No. 54 to 150 gr.	Flour, CF F. FF.
Kegs, ₩ lb.....	4½¢	5 ¢	2½¢
½ kegs, ₩ lb...	4½¢	5½¢	2½¢
¼ kegs, ₩ lb...	5 ¢	5½¢	3 ¢
10-lb cans, 10 in case.....	6 ¢	6½¢	5 ¢
10-lb cans, less than 10.....	10 ¢	10 ¢	

Enameled and Tinned Ware See Ware, Hollow.

Escutcheon Pins—See Pins, Escutcheon.

Escutcheons.

Door Lock....Same dis as Door Locks.
Brass Thread.....60@60&10%
Wood.....25%

Expanded Metal.

List No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Extractors, Lemon Juice—See Squeezers, Lemon.

Fasteners, Blind—

Mackrell's, ₩ dos. $1.00.....20@20&10%
Van Sand's Screw Pat., $15 ₩ gr..60&10%
Van Sand's Old Pat., $15.00 ₩ gr..55&10%
Austin & Eddy No. 2008 ₩ gr.....$4.00
Security Gravity, ₩ gr.....$9.00
Zimmerman's.....45 %

Faucets.—

Fenn's.....40%
Bohren's Pat. Rubber Ball.....25%
Fenn's Cork Stops.....33⅓%
Star.....60%
Frary's Pat. Petroleum.....40&5&2%
B. & L. B. Co.
West's Lock, Open and Shut Key..50%
Star, Metal Plug, new list.....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@ 60&10&10%
Cork Lined.....70&5@70&10%
Burnside's Red Cedar.....50%
Burnside's Red Cedar, bbl lots....50&10%
John Sommers'
Peerless Best Block Tin Key.....40%
IXL, 1st quality, Cork Lined.....50%
Diamond Lock.....40%
Perfection, Fla. Red Cedar.....50%
Goodenough Cedar.....50%
Boss Metallic Key.....50%
Reliable Cork Lined.....60%
Western Pattern Cork Lined.....50%
Self-Measuring
Enterprise, ₩ doz $36.00.....20&10%
Lane's, ₩ doz $36.00.....25&10%
Victor, ₩ doz $36.00.....25&10%

Felloe Plates—See Plates, Felloe.

Fifth Wheels.—

Derby and Cincinnati.....45&25%
Brewster.....50&5%

Files—

Domestic—

Nicholson Files, Rasps, &c.
60&10@60&10&5%
Nicholson (X. F.) Files.....25%
Nicholson's Royal Files (Seconds).....75% (extra prices on certain sizes)
G. & H. Barnett (Black Diamond).
60&10@60&10&5%
Arcade.....60&10@60&10&10%
Eagle.....60&10@60&10&10%
Other makers, best brands 60&10@60&20%
Fair brands.....60&10&10@70&5%
Second quality.....70&10@75&10%
Heller's Horse Rasps.....50&7½@50&10%
McCaffrey's Horse Rasps.....50&10%
Chelsea Horse Rasps, Hand Cut..50&10%
Arcade Horse Rasps.....60&10%

Imported—

Butcher.....Butcher's list, 20%
Stubs.....Stubs list, 25@30%

Fixtures.

Grindstone—

Sargent's Patent.....70&10%
Reading Hardware Co.....30&10%
P., S. & W. Co.....50&10%

Fluting Machines—See Machines, Fluting.

Fluting Scissors—See Scissors, Fluting.

Fodder Squeezers—See Squeezers, Fodder.

Forks—

Hay, Manure, &c., Asso List..65&5@65&10%
Hay, Manure, &c., Phila. List. 60@60&5%
Plated, see Spoons.

Frames—

Saw—

White Vermont.....₩ gro $9.00@10.00
Red, Polished and Varnished.....₩ doz $1.50, 25%

Screen, Window and Door—

Porter's Pat. Window and Door Frame. 33⅓&10%
Warner's Screen Corner Irons..33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%
Cortland.....40@40&5%

Freezers, Ice Cream—

White Mountain.....60@60&5%
Granite State.....65@65&5%
Arctic.....70@70&5%
American.....60%
Buffalo Champion.....65@65&5%
Shepard's Lightning.....65@65&5%
Gem.....65%
Blizzard.....70%
Double Action Crown.....60%
Crown.....60%
Star.....60%
Peerless.....60&10%
Giant.....60%
Zero.....60&10&10%
Boss and Pet.....60&10&10&10%
Keystone, P. D. & Co., each $1.50.....20%

Fruit and Jelly Presses—See Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10 %; 2 to 5 gro., 20 %; 5 to 10 gro.....30 %
Copper, 1 to 6 dos., 15 %; 6 to 12 dos., 20 %; over 12 dos.....25 %

Furnaces, Soldering.

Burgess No. 3 Gem, tin reservoir....$7.00
Burgess No. Gem, copper reservoir, 8.50

Fuse—Dis. 12½%. ₩ 1000 ft
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.25
Single Taped Fuse, for wet ground.. 3.25
Double Taped Fuse, for very wet gr. 4.25
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates, Molasses—

Stebbin's Pattern.....30@30&5%
Stebbin's Genuine.....60&10&10%
Stebbin's Tinned Ends.....40&10%
Chase's Hard Metal.....50&10%
Bush's.....30%
Lincoln's Pattern.....70@70&10%
Weed's.....30&10%
Boss, ₩ dos:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10.....60&10&10%

Gauges.

Marking, Mortise, &c.....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....20&10%
Wire, Wheeler, Madden & Co.....10,
Wire, Morse's.....25%
Wire, Brown & Sharpe's.....10@20%
Wire, P. S. & W. Co.....10&10

Gimlets—

Nail and Spike.....50&10&5%
"Eureka" Gimlets.....40&10%
"Diamond" Gimlets.....₩ gr $5.00
Double Cut, Shepardson's.....45@45&5%
Double Cut, Ives'.....60@60&5%
Double Cut, Douglass'.....40&10%
"Bee," ₩ gr $12.....25@25&5%

Glue—

Le Page's Liquid.....25@25&5%
Upton's Liquid.....35%
Improved Process.....25@25&5%
Dodd's Liquid Glue.....25@25&5%

Glue Pots—See Pots, Glue.

Grease, Axle.

Fraser's.....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes.....₩ gr $9.50
Dixon's Everlasting, in bxs...₩ dos 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 85¢
Lower grades, special brands, ₩ gr $5.50@$7.00

Grindstones—

Small, at factory.....₩ ton $7.50@8.00
Family, regular list.....60%
Family, Cleveland Stone Co.....20 %

Grindstone Fixtures—See Fixtures Grindstone.

Hack Saws—See Saws.

Hafts, Awl.

Sewing, Brass Fer. ₩ gr, $3.50.....45&10%
Pat. Sewing, Short, $1.00 ₩ doz, gr..40&10%
Pat. Sewing, Long.....₩ dos $1.20
Pat. Peg, Plain Top, ₩ gr $10.00...45&10%
Pat. Peg, Leather Top, ₩ gr $12.00.45&10%

Halters.

Covert's, Rope, Jute.....60&10&10&2%
Covert's, Rope, 7-16-in., Jute.....70&2%
Covert's, Rope, ½-in. Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie. 50&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co., Humason & Beckley, Atha Tool Co., Verree.....50@50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail...40&12½%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting.50&5%
Hartford, Nail Hammers.....40&5%
Hartford, Machinists, &c...50&5@50&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles.....20@20%
Peck, Stow & Wilcox.....40%
Sargent's.....33⅓&10%

Heavy Hammers and Sledges—

3 lb and under.....₩ lb 40¢
3 to 5 lb.....₩ lb 36¢ } 70@70&10%
Over 5 lb.....₩ lb 30¢
Wilkinson's Smiths.....10½¢@11¢₩ lb

Handcuffs and Leg Irons—See Police Goods,

Handles—

Cross-Cut Saw Handles—

Atkins' No. 1 Loop, ₩ pair, 28¢; No. 3 13¢; No. 6, 16¢; No. 2 and No. 4 Reversible, 18¢.
Champion.....18¢

Iron, Wrought or Cast—

Door or Thumb.

Nos.....	0	1	2	3	4
Per doz....	$0.90	1.00	1.10	1.35	1.50

60&10&2

Goggin's Latches.....₩ doz 30¢@$
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no Plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70%

Wood—

Saw and Plane.....40&10@40&10&5%
Hammer, Hatchet, Axe, &c...40@40&5%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd. ₩ gr 4.50 } 60%@10%
Hickory Firmer Chisel, large. ₩ gr 5.00 }
Apple Firmer Chisel, ass'd...₩ gr 5.00 } 60%@10%
Apple Firmer Chisel, large...₩ gr 6.00 }
Socket Firmer Chisel, ass'd...₩ gr 3.00 } 60%@10%
Socket Framing Chisel, ass'd. ₩ gr 5.00 }
I. B. Smith & Co.'s Pat File.....50%
File, assorted.....₩ gr 9 75
Auger, assorted.....₩ gr 5.00 } 50%
Auger, large.....₩ gr 7.00 }
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1.25
Pat. Auger, Swan's.....₩ set $1.00
Hoe, Rake, Shovel, &c.....50&10%

Hangers—

Barn Door, old patterns...60&10&10@70%
Barn Door, New England...60&10&10@70
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Wood Track.....55%
U. S. Wood Track.....65%
Champion.....60&10%
Rider and Wooster, Medina Mfg. Co.'s list.....70%
Climax Anti-Friction.....55%
Climax Anti-Friction for Wood Track.....55%
Zenith for Wood Track.....55%
Reed's Steel Arm.....50%
Challenge, Barn Door.....50%
Sterling.....50@50&10%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Cherltree.....50&10%
Kidder's.....50&10@60%
Boss.....60&10%
Best Anti-Friction.....60&10%
Duplex (Wood Track).....60&10&5%
Terry's Pat., ₱ doz pr. 4 in, $10.00; 5 in. $12.00.....50&10%
Terry's Steel Anti-Friction Leader 50&10%
Terry's Steel Anti-Friction Ideal..50&10%
Cronk's Patent, Steel Covered.....50@5%
Wood Track Iron Clad, ₱ ft. 10¢.....50&15@60%
Carrier Steel Anti-Friction.....50&10%
Architect, ₱ set $6.00.....20%
Eclipse.....20&10%
Felix, ₱ set $4.50.....20%
Richards'.....30@30&10%
Lane's Standard.....50&5@50&10%
Lane's New Standard.....50@50&5%
Lane's Parlor.....40%
Ball Bearing Door Hanger..20&10@25&10%
Warner's Pat.....20&10@20&10&10%
Stearns' Anti-Friction.20&10@20&10&10%
Stearns' Challenge.....25&10@25&10&10%
Faultless.....40@40&5%
American, ₱ set $6.00.....20&10%
Rider & Wooster, No. 1, 62½¢; No. 2, 75¢.....40%
Paragon, Nos. 1, 2 and 3.....40&10%
Cincinnati.....25&10%
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel Cast Iron.....50%
Nickel, Malleable Iron and Steel.....40%
Scranton Anti-Friction Single Strap33⅓%
Wild West, 4 in. Wheel, $15.00; 5 in. Wheel, $21.00.....45%
Star.....40&10@40&10&5%
May.....50&5@50&10%
Barry, $6.00.....40&10%
Interstate.....50%
Magic.....45%
Pendulum, Payson's.....40%

Harness Snaps—See Snaps.

Hatchets—

American Axe and Tool Co. Blood's, Hunt's, Hurd's, Mann's, Peck's, Underhill's.....40 & 10 @ 50&5 %
Buffalo Hammer Co.
Fayette R. Plumb.
C. Hammond & Son.
Kelly's.
Sargent & Co.
P., S. & W. Co.
Ten Eyck Edge Tool Co.
Collins.....10%
Schulte, Lohoff & Co.....60@50&5%

Hay and Straw Knives—See Knives.

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50.....75&10&5@80%
Clark's Mortise Gravity.....50%
Sargent's Nos. 1, 3, 5, 11, 13.....75&10@55&10&5%
Sargent's, No. 12.....77&10&10%
Reading's Gravity.....75&10@75&10&5%
Thepard's Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₱ doz $4.40, 60%
N. E.....₱ doz $7.00, 55%
W. E. Reversible.....₱ doz $5.20, 55&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....₱ doz $5.00, 55&10%
Automatic.....₱ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts.....40%
Union Spring Hinge Co.'s list, March 1886.....2½%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent.....40%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem, and Star.....20%
Oxford.....20%
Wiles'.....10%
Devore's.....40%
Rex.....40%
Royal.....60%
Reliable.....60%
Champion.....60%
Stearn's.....50&10%
Samson, ₱ gross.....$14.00
Extra 5&10 % often given.

Wrought Iron Hinges.

List February 14, 1891.
Strap and T.....50&10%
Corrugated Strap & T. ....50@50&10%
Screw Hook and Strap..... { 6 to 12 in., ₱ D. 4¢ / 14 to 20 in., ₱ D. 3½¢ / 22 to 36 in., ₱ D. 3¢
Screw Hook and Eye.... { ⅛ in., ₱ D 7¾¢ / ⅜ in., ₱ D 5¾¢ / ½ in., ₱ D 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 .....50&10%
Rolled Blind Hinges, Nos. 232 and 234 .....55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10%
Plate Hinges { "Providence" { 8, 10 & 12 in., ₱ D.....5¢ / over 12 in., ₱ D.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent Planters Pattern..45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat. / Am. Axe and Tool Co., S. & O. Pat.
Chattanooga Tool Co., S. & O. Pat..60&5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70%
Planter's, Cotton &c.....70%
Warren Hoe.....60%
Magic.....₱ doz $4.00

Hog Rings and Ringers—See Rings and Ringers.

Hoisting Apparatus—See Machines, Hoisting.

Hollow-Ware—See Ware, Hollow.

Holders.

Bag.

Sprengle's Pat.....₱ doz $18.....60%

Bit.

Extension, Barber's, ₱ doz $15.00.....40@40&10%
Ives, ₱ doz $20.00.....60&5@60&10%
Diagonal.....₱ doz $24.00, 40%
Angular.....₱ doz $24.00, 40&5%

File and Tool—

Rals Pat.....₱ doz $4.00; 25%
Nicholson File Holders.....20%
Dick's Tool Holder.....20%

Hooks—

Cast Iron—

Bird Cage, Sargent's list..... / Bird Cage, Reading..... / Clothes Line, Sargent's list.. / Clothes Line, Reading list. 60&10@60&10&10%
Ceiling Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading.50&10@50&10&10%

Wrought Iron—

Cotton.....₱ doz $1.25
Cotton Pat. (N.Y. Mallet & Handle W'ks). 30%
Tassel and Picture (T. & S. Mfg. Co.)..50%
Wrought Staples, Hooks, &c. See Wrought Goods.

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10%
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat..45@15&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&80&10%
Atlas, Coat and Hat.....60@60&10%
Bright Wire Goods, see *Wire.*

Miscellaneous.

Grass, No. 2, $2.00; No. 3, $2.25; No. 4, $2.50
Nolin's Grass.....₱ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks.....See Bench Stops.

Horse Nails—See Nails, Horse.

Horse Shoes—See Shoes, Horse.

Hose, Rubber—

Competition.....75@75&5%
Standard.....60&10&5@60&10&10%
Extra.....60&10@60%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40@40&5%
N. Y. B. & P. Co., Dundee....50&10 @ 60%

Huskers—

Blair's Adjustable.....₱ gr $8.00
Blair's Adjustable Clipper....₱ gr 7.00
Hubbard's Solid Steel.....₱ gr 4.50

Indurated Fiber-Ware—See Ware, Indurated Fiber.—

Irons.

Sad—

From 4 to 10, at factory....₱ 100 ℔, $2.30@$2.40
Self-Heating.....₱ doz $9.00 net
Self-Heating, Tailors'....₱ doz $18.00 net
Mrs. Pott's Irons.....60@60&10%
Enterprise Star Irons.....60@60&10%
XX Cold Handle Sad Iron.....60&5@60%
Ideal Irons new list.50&10@50 & 10&10%
Salamander, Irons.....25%
B. B. Sad Irons, ₱ ℔.....3 @3¼¢
Combined Fluter and Sad Iron, ₱ doz, $15.00.....15%
Fox Reversible, Self-Fluter ₱ doz $24.00
Chinese Laundry (N.E. Butt Co.) 8¼¢, 15%
New England.....5¢, 15%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓ %
National Self-Heating.....30 %

Soldering—

Soldering Coppers.....₱ D 19 @ 21¢
Covert's Adjustable, list Jan. 1 1886. 35&2%

Irons, Pinking, per doz., 65¢.

Jack Screws—See Screws.

Jacks, Wagon.

Daisy.....40%
Victor.....40%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91.20%
Enameled and Tea—See Hollow Ware.

Keys—

Lock Asso'n list Dec. 30, 1886...50&10@60&5%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss, Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Ratchet Bed Keys.....₱ doz $4.00, 15%
Wollensak Tinned.....50&10%

Knife Sharpeners—See Sharpeners, Knife.

Knives.

Butcher, Shoe, &c—

Wilson's Butcher Knives, List Dec. 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AAA1, Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives. ₱ doz $1.50, 15@20%
Moran's Shoe and Bread.....30%
Hay and Straw.....See Hay Knives.
Table and Pocket.....See Cutlery.
Corn, Auburn Mfg. Co. Western Pat., $2.00
Corn Auburn Mfg. Co. Crescent....$3.50

Corn—

Bradley's.....10%
Wadsworth's.....25%

Dracing—

Witherby, P. S. & W., Mix, New Haven.....75 @ 75&10 %
Merrill.....60&10@60&10&5%
Douglas.....75@75&5%
Watrous.....15&10@25%
L. & L. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00 @ $9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle.....₱ doz $11.00@$11.50
Heath's.....₱ doz $13.00@13.50
Auburn Hay, Corn, and Spear Point..50%
Auburn, Straw.....40%
Nolin's Hay.....₱ doz.$7.00 @ $8.00

Mincing.

Am. (3d quality), ₱ gr., 1 blade, $7; 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₱ doz, Single, $2.00: Double, $3 40@45%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable.....₱ doz $3.00 .25%
Buffalo Double Adj'table, ₱ doz $3.00 25%

Knobs—

Door Mineral.....60@65%
Door Por. Jap'd.....70@75%
Door Por. Nickel.....$2.00@2.25
Door Por. Plated, Nickel.....$2.00@2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Furniture, Plain.....75¢ gro inch, 10%
Furniture, Wood Screws.....25&10%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₱ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c..40%

Ladies.—

Melting, Sargent's.....55&10%
Melting, Reading.....35&10%
Melting, Monroe's Pat...₱ doz $4.00, 40%
Melting, P. S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Plain with Guards, ₱ doz.....$3.75@4.00
Lift Wire, with Guards.....$4.00@4.25
Square Plain, with Guards....$3.75@4.00
Sq. Lift Wire, with Guards.....$4.50

Police Lanterns (including packages).

2¾-inch Bull's-eye Police regular..... ₱ doz $3.60
3-inch Bull's-eye Police regular..... ₱ doz $3.90
2¾-inch Bull's-eye Police flash light ... ₱ doz $4.00
3-inch Bull's-eye Police flash light ... ₱ doz $4.50

Lawn Mowers—See Mowers, Lawn.

Leaders, Cattle.

Humason. Beckley & Co.'s.....70%
Sargent's.....66⅔&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—See Squeezers, Lemon.

Lifters, Transom.

Wollensak's:
Class 3 and 4, Bronzed Iron.....50%
Class 3 and 4, Bronze Metal.....25%
Class 3 and 4, Brass.....25%
Skylight Lifters.....25%
Crown, Eagle and Shield.....50%
Reiher's, list Feb. 20, 1891.
Bronzed Iron Rods.....50&10&10&2%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish, Draper's.....50%
Draper's and Tate's Chalk.....60%
Draper's Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....52%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₱ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes. Nos. 12 to 19.....40%
100 ft. $3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..₱ doz $7.50, 30

Links, Open.

Terry's—per gro.:

Nos.....	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin.... } List March, '84, rev Jan.1,'85..33⅓&2%
Delta, Nos. 36 to 39.....40%
Delta, Nos. 51 to 63.....40&10%
Delta, Nos. 86 to 96.....30%
Stoddard Lock Co.....30@33⅓%
"Champion" Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....35&2%
"Champion" Cab. and Combin...33⅓%
Yale.....net prices
Romer's.....25%

Door Locks, Latches, &c.

R. & E. Mfg. Co., list Mar. 20, 1889..... } Much lower net prices often made. 65&10@70%
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., list Aug. 1, '88
Reading Hardware Co., list Feb. 2, '88.....
Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Perkins' Burglar Proof.....60&25%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Delta Flat Key.....30%
L. & C. Round Key Latches.....30&10%
L. & C. Flat Key Latches.....33⅓&10%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Shepardson or U. S.....35%
Seed's N. Y. Hasp Lock.....25%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list...70&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....25&2%
Eureka, Eagle Lock Co.....40&2%
Romer's, Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 506..15%
A. E. Delta.....40%
Champon Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₱ doz, 39, 40&40&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Brown's Pat.....25%
Scandinavian.....90@90&10%
E. T. Fraim's Keystone Scandavian. Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Blaymaker Barry & Co.
No. 1010 line.....35&5%
No. 41 line.....45&10%
No. 61 line.....50&5%
No. 21 line.....75%

Sash, &c.

Clark's, No. 1, $10; No. 2, $8 ₱ gr..33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Stoddard "Practical".....10%
Ives' Patent.....60&10@60&10&5%
Liesche's, No. 100, ₱ gr $8; 105, $10..30%
Davis, Bronze, Barnes Mfg. Co.....50%
Champion Safety, list January, 1889..70%
Security.....70%
Giant, list Jan., 1892.....70&5%

Lumber Tools—See Tools, Lumber

Lustre—

Four-ounce Bottles....₱ doz, $1.75; ₱ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.	
Douglas		$5.50	$6.75	50%
Snell's, Rice's Pat.		5.50	6.75, 40	&10&10%
Jennings		5.50	6.75, 45	&45&10%
Other Machines		2.35	2.75	
Phillips' Patent with Augers		7.00	7.50	
Miller's Falls		7.50		25%

Fluting.

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Roll, $2.15.....35%
Eagle, 5½-inch Roll, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel 6 in.....$5.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; $12.50; 3, $10.00.....30%
Shepard Hand Fluter, No. 85 ₱ doz 15 20.....40%
Shepard Hand Fluter, No. 110 ₱ doz $11.00.....40%
Shepard Hand Fluter, No. 95 ₱ doz $8.00.....40%
Clark's Hand Fluter.₱ doz $15.00.....35%
Combined Fluter and Sad Iron, ₱ doz $15.00.....30%
Buffalo ₱ doz $10.00.....10%

Hoisting—

Moore's Hand Hoist, with Lock Brake.....20%
Moore's Differential Pulley Block....40%
Energy Mfg. Co's.....25%
Sure Grip Steel Tackle Blocks.....25%

Washing—

Anthony Wayne, ₱ doz No. 1, $51 No. 2, $45; No. 3, $42.
Western Star ₱ doz No. 2, $45 No. 3 $48.

Mallets.
Hickory ..... 20&10@20&10&10%
Lignumvitæ ..... 20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10%

Mattocks. Regular list. 60&10@60&10&5%

Measures—
Standard Fiberware, No. 1, peck, ₩ dozen, $4; ½-peck, $3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per doz. $2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888. 60@60&10%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co. 20&10@30%
The Swift, Lane Bros. ..... 20&10%

Mincing Knives — See Knives, Mincing.

Molasses Gates—See Gates, Molasses.

Money Drawers — See Drawers, Money.

Mowers, Lawn.
Pennsylvania, New Model, Excelsior, Continental, &c. ..... 60@60&5%
Philadelphia ..... 60&10%
Perfection ..... 60&10&10%
Easy ..... 60&10@60&10&5%
Bay State ..... 60&10@60&10&2%
Other Machines ..... 60&10&5@70%

Muzzles—
Safety ..... ₩ doz. $3.00, 25%

Nails,
Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, July 15, '89. 75&10@80%
Tack Mfrs.' list. ..... 70@70&10%
Wire Nails, Standard Penny.
Card June 1 '89 base. ..... $1.95 @ $2.00

Horse—

Nos.	6	7	8	9	10
Ausable	28¢	26¢	25¢	24¢	23¢.

40&5&5&2%

Clinton, Pin.	19¢	17¢	16¢	15¢	14¢ 30%
Essex	28¢	26¢	25¢	24¢	23¢.

40&5&5&2%

Lyra	19¢	17¢	16¢	15¢	14¢ 30%
Snowden	19¢	17¢	16¢	15¢	14¢ 30%
Putnam	23¢	21¢	20¢	19¢	18¢.

1000 ℔ in year 15%

Vulcan	23¢	21¢	20¢	19¢	18¢..15&5%
Northwest'n.	25¢	23¢	22¢	21¢	20¢.

25@25&5%

Globe	23¢	21¢	20¢	19¢	18¢.

20&5&5%

Boston	23¢	21¢	20¢	19¢	18¢.

20&5&5%

A. C.	25¢	23¢	22¢	21¢	21¢.

25&10@33⅓&5%

C. B.-K.	25¢	23¢	22¢	21¢	21¢.

25&10@33⅓&5%

Maud S.	25¢	23¢	22¢	21¢	21¢.

40&10%

Champlain	28¢	26¢	25¢	24¢	23¢.

25&10&10%

Saranac	23¢	21¢	20¢	19¢	18¢...30&10%
Champion	25¢	23¢	22¢	21¢	20¢.

10&10&10%

Capewell	28¢	26¢	5¢	24¢	23¢.

35&5@35&10%

Star	23¢	21¢	20¢	19¢	18¢.

10&10&10&12½%

Anchor	23¢	21¢	20¢	19¢	18¢ 35%
Western	23¢	21¢	20¢	19¢	18¢...40&10%

Empire Bronzed. ..... 14 ₩ ℔.

Picture—
Brass Head, Sargent's list. ..... 50&10&10%
Brass Head, Combination list. ..... 50&10%
Porcelain Head, Sargent's list. 50&10&10%
Porcelain Head, Combination list. 40&10%
Niles' Patent. 40%

Nail Pullers.—See Pullers, Nail.
Nail Sets.—See Sets, Nail.
Nut Crackers.—See Crackers, Nut.
Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.35¢	5.90¢ off list.
Cold Punched	5.00¢	5.10¢ off list.

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—
Best or Government. ..... ₩ ℔ 7@7½¢
U. S. Navy. ..... ₩ ℔ 6@6½¢
Navy. ..... ₩ ℔ 5½@6¢

Oilers—
Zinc and Tin ..... 65&10&70&5%
Brass and Copper ..... 50&10&50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10&10&5%
Malleable, Hammers, Old Pattern, same list 40%
Prior's Pat. or "Paragon" Zinc, 60&10&10%
Prior's Pat. or "Paragon" Brass. 50%
Olmstead's Tin and Zinc. 60%
Olmstead's Brass and Copper 50%
Broughton's Zinc. 60%
Broughton's Brass 50%
Gem P. D. & Co. ..... ₩ gro. $2
Steel, Draper and Williams. 50%

Openers, Can.
Messenger's Comet. ..... ₩ doz $3.00, 25%
American. ..... ₩ gross $2.75@$3.00
Duplex. ..... doz 25¢, 15@20%
Lyman's. ..... ₩ doz $3.75, 20%
No. 4 French. ..... ₩ doz $2.25, 55@60%
No. 5, Iron Handle. ..... ₩ gr $6.00, 45@50%
Eureka. ..... ₩ doz $3.50, 10%
Sardine Scissors. ..... ₩ doz $2.75@3.00
Star. ..... ₩ doz $2.75
Sprague, No. 1, $2.00 2, $2.25; 3, $2.50. 50&10&10%
Excelsior No. 1 $2.50; No. 2, $1.50. ..... 40%
World's Best, ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00. ..... 50&10%
Universal, ₩ doz $3.00. ..... 55&5%
Domestic, ₩ doz $2.50. ..... 40%
Champion ₩ doz $2.00. ..... 5¢

Packing, Steam—
Rubber—
Standard. ..... 60&5@65%
Extra ..... 50@50&5%
N. Y. B. & P. Co., Standard. 50%
N. Y. B. & P. Co., Empire. 60%
N. Y. B. & P. Co., Salamander. 25%
Jenkins' Standard. ₩ ℔ 80¢. ..... 25@25&5%
Miscellaneous—
American Packing. ..... 10¢@11¢ ₩ ℔
Russia Packing ..... 14¢ ₩ ℔
Italian Packing ..... 13¢@14¢ ₩ ℔
Cotton Packing ..... 15¢@17¢ ₩ ℔
Jute. ..... 7¢@8¢ ℔

Pails.
Galvanized Iron—

Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ ds.	3.00	3.25	3.75
Helwig's.	2.50	2.75	3.00
Sidney Shepard & Co.	2.35	2.85	3.05
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets, see Well Buckets.
Indurated Fibre Ware—25%
Star Pails, 12 qt. ..... ₩ doz $5.40
Stable and Milk, 14 qt. ..... ₩ doz $6.00
Fire Pails, deep. ..... ₩ doz $5.40
" round bottom. ..... ₩ doz $7.80
Standard Fibre Ware—

	Plain.	Decr'd
Water Pails, 12 qt., per doz.	$4.00	$4.50
Dairy Pails, 14 qt., per doz.	4.50	5.00
Fire Pails, No. 1, 12 qt. per doz	4.50	
Fire Pails, No. 2, 14 qt. per doz	5.00	
Sugar Pails	6.00	6.50
Horse Pails	5.00	"
Buggy Pails	4.00	"
Slop Jars (bal. trap)	8.00	9.00
Chamber Pails, 14-qt.	6.50	7.50

Pans.
Dripping.
Smalls ises. ..... ₩ ℔ 6¼¢
Large sises. ..... ₩ ℔ 5½¢
Silver & Co. (Covered). 40%
Fry—
Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	$4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods. ..... 75@75&10%
Acme Fry Pans ..... 60&10%
Dust—
Steel Edge, No. 1. ..... ₩ doz $1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1886. ..... 50@50&10%
Sibley's Emery and Crocus Cloth. 30%

Parers.
Apple.
Advance. ..... ₩ doz $4.75
Baldwin. ..... ₩ doz 5.25
Bonanza. ..... each 5.00
Daisy. ..... ₩ doz 4.00
Dandy. ..... each 7.50
Eclipse. ..... ₩ doz 4.25
Eureka, 1883. ..... each 16.00
Family Bay State. ..... ₩ doz 12.00
Favorite ..... ₩ doz 5.00
Gold Medal. ..... ₩ doz 4.00
Ideal. ..... ₩ doz 4.00
Improved Bay State. ₩ doz 27.00 @ 30.00
Little Star. ..... ₩ doz 4.50
Monarch. ..... ₩ doz 13.50
New Lightning. ..... ₩ doz 5.50
Oriole. ..... ₩ doz 4.00
Penn. ..... ₩ doz 4.00
Perfection. ..... ₩ doz 4.00
Pomona. ..... ₩ doz 4.00
Rocking Table. ..... ₩ doz 6.00
Turn Table. ..... ₩ doz 4.50
Victor. ..... ₩ doz 13.50
Waverly. ..... ₩ doz 4.00
White Mountain. ..... ₩ doz 4.00
72. ..... ₩ doz 4.25
78. ..... ₩ doz. 7.00
Potato—
White Mountain ..... ₩ doz $4.50
Antrim Combination. ..... ₩ doz $5.50
Hoosier. ..... ₩ doz $13.50
Saratoga. ..... ₩ doz $5.50

Pencils—
Faber's Carpenters'. ..... high list 50%
Faber's Round Gilt. ..... ₩ gro $5.25
Dixon's Lead. ..... ₩ gro $4.50
Dixon's Lumber. ..... ₩ gro $6.75
Dixon's Carpenters'. 10%

Picks—
Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00. ..... 60&10@60&10&5%

Picture Nails.—See Nails, Picture.

Pinking Irons.—See Irons, Pinking.

Pins.
Bow—
Humason, Beckley & Co.'s. ..... 60&10%
Sargent & Co's. ..... $17 and $18. ..... 60&10%
Peck, Stow & W Co. ..... 50&10&50&10&5%
Curtain—
Silvered Glass. ..... net
White Enamel. ..... net
Escutcheon, ₩
Iron, list Nov. 11, 1885. ..... 50&10@50&10&5%
Brass. ..... 60@60&5%

Pipe, Wrought Iron—
List September 18, 1889.
1¼ and under, Plain ..... 57½@61%
1¼ and under, Galvanized. ..... 47½@51%
1½ and over, Plain. ..... 67½@70%
1½ and over, Galvanized. ..... 55@71½%
Boiler Tubes,
Sizes up to 2¾ in. inclusive. 55%
Sizes 3 in. and larger 65%
Casing. 55%
Inserted Joints Casing 50%
Steel Boiler Tubes 30%

Planes and Plane Irons—
Wood Planes—
Molding. ..... 40&10%
Bench, First Quality. ..... 50&10%
Bench, Second Quality. ..... 55&10%
Bailey's (Stanley R. & L. Co.). ..... 5%&10%
Iron Planes—
Bailey's (Stanley R. & L. Co.). ..... 50&10%
Miscellaneous Planes (Stanley R. & L. Co.) ..... 25&10%
Steer's Iron Planes. ..... 35&35&10%
Meriden Mal. Iron Co.'s. ..... 40@40&10%
Davis's Iron Planes ..... 40@40&10%
Birmingham Plane Co. ..... 50@50&10%
Gage Tool Co.'s Self-Setting. ..... 20&10&10%
Chaplin's Iron Planes ..... 40@40&10%
Sargent's ..... 30&10@30&10&10%
Standard Tool Co. ..... 50@50&5%
Plane Irons—
Butcher's. ..... $5.00@$5.25 to £
Buck Bros 30%
Auburn "Thistle." } ..... 30&10%
Ohio. }
Sandusky. }
S. & I. J. White 25%
Stanley R. & L. Co ..... 50&10%

Plates.
Fallow ..... ₩ ℔ 6¢@6½¢

Pliers.
Button's Patent. ..... 50@50&10%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in. $21.00 ₩ doz .. .. 30&10@33⅓%
Humason & Beckley Mfg. Co. 50@50&10%
Lindsay's Giant. 40%
Gas Pliers. 60%
Gas Pliers, Custar's Nickel Plated. 60&5%
Eureka Pliers and Nippers 40%
Russell's Parallel. 25%
P. S. & W. Cast Steel 50%
P. S. & W. Tinners' Cutting Nippers, add 5% dis 10%
Carew's Pat. Wire Cutters. 20%
Morrill's Parallel, ₩ doz, $12.00. ..... 30&5%
Cronk's 8 in., $15.00; 10 in. $21.00, 50@50&5%
Cronk's Button Pattern ..... 50&10&5%
Cronk's Carrier Pliers. ..... 60@60&5%

Plumbs and Levels

Regular Plumb	.75&10@.75&10&5%
Stanley's Duplex	20&10%
Stanley's Handy	20&10%
Disston's	50%
Pocket Levels	70&10@70&10&10%
Davis Iron Levels	30%
Davis' Inclinometers	10&10%

Poachers.
Egg.
Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00. ..... 25%
Silver & Co., 6-Ring, ₩ doz $4; 8-Ring $2

Pokes, Animal—
Bishop's I. X. L. ..... ₩ doz $6.00
Bishop's O. K. ..... ₩ doz $5.25
Bishop's Pioneer. ..... ₩ doz $3.75
Bishop's American. ..... ₩ doz $2.75
Eagle, Double Stale. ..... ₩ doz $5.75
Eagle, Single Stale. ..... ₩ doz $3.75
Buckeye, Single Stale. ..... ₩ doz $2.75

Police Goods.
R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's. 25%
Daley's Improved Handcuffs: 2 Hands, Polished, ₩ doz $43.00; Nickeled, $57.00; 3 Hands, Polished, ₩ doz $72.00; Nickeled, $84.00. ..... 25%
J. P. Lovell's Police Goods. 25%

Polish, Metal.
Prestoline. 30%
Prestoline Paste. 33⅓%
Gaston's Silver Compound. 33⅓%

Polish, Stove.
Joseph Dixon's. ..... ₩ gro $6.00, 10%
Gem. ..... ₩ gro $4.50, 10%
Gold Medal. ..... ₩ gro $6.00, 25%
Mirror ..... ₩ gro $6.00, —%
Lustro ..... ₩ gro $4.75
Ruby ..... ₩ gro $3.75
Rising Sun, 5 gro lots ..... ₩ gro $5.50
Dixon's Plumbago. ..... ₩ ℔ 8¢
Boynton's Noon Day, ₩ gro 13.00
Parlor Pride Stove Enamel. ₩ gro
Yates' Liquid, 2 3 5 10 gal.
₩ gal .$0.80 .70 .60 .50
Yates Standard Paste Polish, 10-℔ cans, ₩ ℔ 12½¢
Jet Black ..... ₩ gro $3.50
Japanese. ..... ₩ gro $3.50
Fireside. ..... ₩ gro $2.50
Diamond O. K. Enamel. ..... ₩ gro $19.00
Bonnell's Liquid Stove Polish. ₩ gro $9.00
Bonnell's Paste Stove Polish. ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans ..... 13½¢
Black Jack Water Paste, 5 and 10 ℔ cans ..... 12½¢
Nickel Plate Paste ..... ₩ gro $6.00
Crown Paste ..... ₩ gross, $7.20
Crown Paste, in 5 and 10 ℔ pails ₩ ℔ 12¢
Black Flag ..... ₩ gross, $7.20
Black Flag, 5 and 10 ℔ pails. ..... ₩ ℔, 12¢
Black Flag, liquid, in bottles, ₩ gro. $8.00
Diamond Rock Nickel Cleaner. ₩ gro $10.20

Poppers, Corn—
Round or Square, 1 qt. ₩ gr $10.00@10.50
Round or Square, 1½ qt. ₩ gr $15@15.50
Round or Square, 2 qt. ₩ gr $18.50@19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pots.
Glue—
Tinned. ..... 40&10@40&10&5%
Enameled. ..... 40&10@40&10&5%
Family, Howe's "Eureka." 40%
Family, L. F. C.'s "Handy." 50%

Presses.
Fruit and Jelly—
Enterprise Mfg. Co. ..... 20&10@30%
Henis. ..... ₩ doz $3.50
Shepard's Queen City 40%
Silver & Co. ..... ₩ doz $2.75

Pruning Hooks and Shears.—See Shears.

Pullers.
Nail.
Scranton. ..... ₩ doz $13.00, 33⅓%
Curtiss Hammer. ..... ₩ doz $9.00
Giant, No. 1. ..... ₩ doz. $13.00, 10%
Giant, No. 2. ..... ₩ doz, $15.00, 10%
Pelican. ..... ₩ doz, $9.00, 25%
Eclipse. ..... each, $2.00 net

Pulleys—
Hot House, Awning, &c. ..... 60&10%
Japanned Screw. ..... 60&10%
Brass Screw. ..... 60&10%
Japanned Side. ..... 60%&10%
Japanned Clothes Line. ..... 60&10%
Empire Sash Pulley. ..... 55@60%
Moore's Sash, Anti-Friction. 50%
Hay Fork, Solid Eye, $4.00 Swivel, $4.50. ..... 50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. Solid, $5.70 ..... 50%
Hay Fork, "F" Common and Pat. Bushed. 30%
Hay Fork, Tarbox Pat. Iron. 30%
Hay Fork, Reed's Self-Lubricating. 60%
Shade Rack 25%
Tackle Blocks. ..... See Blocks
Moore's Anti-Friction 5 in. Wheel, ₩ doz $12.00. ..... 40%

Pumps—
Cistern, Best Makers. ..... 60@60&10%
Pitcher Spout, Best Makers. ..... 67½@70%
Pitcher Spout, Cheaper G'ds. ..75@75&10%

Punches—
Saddlers' or Drive, good, ₩ doz. ..60@65¢
Bemis & Call Co.'s Cast Steel Drive. 50&5%
Bemis & Call Co.'s Springfield Socket. 50&5%
Spring, good quality. ..₩ doz $2.50@2.60
Spring, Leach's Pat. 15%
Bemis & Call Co.'s Spring and Check. .40%
Solid Tinners', P. S. & W. Co., ₩ doz $1.44, 55%
Tin'rs' Hollow Punches P. S. & W. Co. 20&2%
Rice Hand Punches. 15%
Avery's Revolving. 40%
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wr't Brass, ₩ ℔ 35¢. 15%
Sliding Door, Bronzed Wr't Iron. ₩ ft. 7¢
Sliding Door, Iron, Painted, ₩ foot 4¢, 40%
Barn Door, Light, In. ½ ¾ 1
Per 100 feet. $2.00 2.50 3.10, 10%
S. D. for N. E. Hangers—

	Small.	Med.	Large.
Per 100 set.	$2.15	2.70	3.25 ..30%

Terry's Steel Rail, ₩ foot. ..... 4½¢
Victor Track Rail, 7¢ ₩ foot. ..... 50&5%
Carrier, double braced, Steel Rail, ₩ foot ..... 4@4½¢
Moore's Wrought Iron. 35%

Rakes—
Cast Steel, Association goods. ..65%@70%
Cast Steel, outside goods 60&10&10@70&5%
Malleable. ..... 70@70&5%
Gibbs Lawn Rake. ..... ₩ doz $4.90
Canton Lawn Rake. ..... ₩ doz $3.75
Favorite Lawn Rake. ..... ₩ doz $4.40
Ft. Madison Prize Bow Brace and Peerless 60%
Fort Madison Steel Tooth Lawn Rake, $6.00. ..... 25%

Razors—
J. R. Torrey Razor Co. 20%
Westenholme and Butcher, $10 to £. .10%
Jordan's AAAI, new list. ..... net
Jordan's Old Faithful, new list. ..... net
Galvanic. ..... ₩ doz $15.00

Razor Strops—See Strops, Razor.

Rings and Ringers.
Bull Rings—
Union Nut Co. 55%
Sargent's. ..... 60%&10@70&5%
Hotchkiss' low list. 30%
Humason, Beckley & Co.'s. ..... 70&10%
Peck, Stow & W. Co's. .50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%
Hog—
Top of the Hill Ringers. ..... ₩ doz $2.00
Top of the Hill Rings. ..... ₩ doz $1.25
Hill's Improved Ringers. ..... ₩ doz $1.25
Hill's Old Style Ringers. ..... ₩ doz $1.12½
Hill's Tongs. ..... ₩ doz $3.00
Hill's Rings. ..... ₩ doz bxs $1.00
Perfect Rings. ..... ₩ doz bxs $1.50
Perfect Ringers. ..... ₩ doz $2.15@$2.25
Blair's Hog Ringers. ..... ₩ doz $2.00
Blair's Hog Rings. ..... ₩ doz 90¢@$1.00
Champion Ringers. ..... ₩ doz $2.00
Champion Rings, Double. ..... ₩ doz $2.25
Brown's Ringers. ..... ₩ doz $2.00
Brown's Rings. ..... ₩ doz $1.15@1.25
Electric Hog Rings. ..... ₩ doz boxes $1.50
Electric Hog Ringers. ..... ₩ doz $2.00

Rivets and Burrs—
Iron, list Nov. 17, '87. ..... 40%
Copper. ..... 60&10@60&10&5%
Coppered Iron, Bettina Brand. 40%

Rivet Sets—See Sets.

Rods—
Stair, Brass. ..... 25&2%
Stair, Black Walnut. ..... ₩ doz 40¢

Rollers—
Barn Door, Sargent's list. ..... 60&10&10%
Acme Moore's Anti-Friction. 55%
Union Barn Door Roller. 70%

Rope.
Manila, 7-16 in. diam. and larger ₩ ℔ 12½¢
Manila. ..... ¾ in. ₩ ℔ 12¾¢
Manila. ..... ½ and 5-16 in. ₩ ℔ 13¼¢
Manila, Tarred Rope. ..... ₩ ℔ 11¾¢
Manila, Hay Rope. ..... ₩ ℔ 12½¢
Sisal. ..... 7-16 inch and larger ₩ ℔ 9¼¢
Sisal. ..... ⅜ in. ₩ ℔ 9¾¢
Sisal. ..... ¼ and 5-16 in. ₩ ℔ 10¼¢
Sisal, Hay Rope. ..... ₩ ℔ 9¼¢
Sisal, Tarred Rope. ..... ₩ ℔ 8¾¢
Sisal, Medium Lath Yarn. ..... ₩ ℔ 8¾¢
New Zealand. ..16 in. & larger ₩ ℔ 8¾¢
New Zealand. ..... ¾ inch, ₩ ℔ 9¼¢
New Zealand, ½ and 5-16 inch, ₩ ℔ 9¾¢
New Zealand, Hay Rope. ..... ₩ ℔ 8¼¢
New Zealand, Tarred Rope. ..... ₩ ℔ 8¼¢
Note.—Manufacturers' prices on above 1¢ ₩ ℔ less, f. o. b. factory—less 1½ % for cash.
Cotton Rope. ..... ₩ ℔ 13¼@16¢
Jute Rope ..... ₩ ℔ 6½@7¢
Wire—
List February, 1892.
A 1 kinds 45%
Galvanized ..... 40&10&10@80&10&10&10%
Boxwood ..... 80&10&10@80&10&10&10%
Boxwood, Stanley R. & L. Co. 80&10&10%
Ivory ..... 50@50&10%
Starrett's Rules and Straight Edges, Steel ..... 25&10%

Sad Irons—See Irons, Sad.
Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery
Sash Cord—See Cord, Sash.
Sash Locks—See Locks, Sash.
Sash Weights—See Weights, Sash.
Sausage Stuffers or Fillers—See Stuffers or Fillers, Sausage.

Saws—The following prices are often cut by jobbers.
Disston's Circular ..... 45@45&5%
Disston's Cross Cuts ..... 45@45&5%
Disston's Hand ..... 20@20&5%
Woodrough & McParlin,
Hand, Panel and Rip. ..... 25@25&5%
Narrow Champion Cross Cuts with Handles, ₩ foot. ..... 18@20¢
Champion Thin Back Cross Cuts, ₩ foot. ..... 26@28¢
Champion Extra Thin Back Cross Cuts, ₩ foot. ..... 29@31¢
One Man Champion Cross Cuts, ₩ foot. ..... 37@40
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip. ..... 3(@3&5%
Narrow Champion Cross Cuts with Handles, ₩ foot. ..... 18@20¢
Champion Thin Back Cross Cuts, ₩ foot. ..... 26@28¢
Champion Extra Thin Back Cross Cuts, ₩ foot. ..... 29@31¢
One Man Champion Cross Cuts, ₩ ft.. 37@40
Atkins' Circular Shingle and Heading dis 50%
Atkins' Silver Steel Diamond X Cuts ₩ foot 70¢
Atkins' Special Steel Dexter X Cuts ₩ foot 50¢
Atkins' Special Steel Diamond X Cuts ₩ foot 33¢
Atkins' Champion and Electric Tooth X Cuts. ..... ₩ foot 30¢
Atkins' Hollow Back X Cuts. ₩ foot 20¢
Atkins' Mulay, Mill and Drag. 40%
Atkins' One-Man Saw, with handles, ₩ foot 40¢
Peace Circular and Mill. ..... 45@45&5%
Peace Hand Panel and Rip. ..... 25@25&5%
Peace Cross Cuts. ..... 45@45&5%
Richardson's Circular and Mill. 45@45&5%
Richardson's X Cuts. ..... 45@45&5%
Richardson's Hand, &c. ..... 25@25&5%
C. E. Jennings & Co., Hand, Panel and Rip ..... ₩ doz 10¢

Hack Saws—

Griffin's, complete. ....40&10@50%
Griffin's Hack Saw, Blades....40&10@50%
Star Hack Saws and Blades....25%
Eureka and Crescent....35%

Scroll—

Lester, complete, $10.00....25%
Rogers, complete, $4.00....25%
Barnes' Builders' and Cab. Makers' $15,25%
Barnes' Scroll Saw Blades....35%

Saw Frames—See Frames, Saw.

Saw Sets—See Sets, Saw.

Saw Tools—See Tools, Saw.

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $21.00
Hatch, Tea, No. 161....₩ doz $6.75@$7.00
Union Platform, Plain....$2.10@$2.30
Union Platform, Striped....$2.40@$2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka....25%
Chatillon's Favorite....40%
Family, Turnbulls....30@30&10%
Richie Bros.' Platform....40%

Scale Beams—See Beams, Scale.

Scissors, Fluting....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.50....30&10%
Box, 1 Handle....₩ doz $4.00, 10%
Box, 2 Handle....₩ doz $6.00, 10%
Defiance Box and Ship....20&10%
Foot....50&10@60%
Ship, Common ....₩ doz $3.50 net
Ship, R. I. Tool Co....10%

Screen Window and Door Frames—See Frames.

Screw Drivers—See Drivers, Screw.

Screws.

Bench and Hand—

Bench, Iron....55&10@55&10&10%
Bench, Wood, Beech....₩ doz $2.25
Bench, Wood, Hickory....20&10%
Hand, Wood....25&10@25&10&5%
Hand, Grand Rapids, list....55%
Lag, Blunt Point, list Jan. 1, 1890..75&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890....75@75&10%
Bed....25&5%
Hand Rail, Sargent's....65%&10%
Hand Rail, H. & F. Mfg. Co...70&10@75%
Hand Rail, Am. Screw Co....75%
Jack Screws, Millers Falls list....50@50&5%
Jack Screws, P. S. & W....35%
Jack Screws, Sargent...60&10@60&10&5%
Jack Screws Stearns'....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's....33⅓@33⅓&5%
Howe Bros & Hulbert....35%

Machine—

Flat Head, Iron....55%
Round Head, Iron....50%

Wood—

List January 1, 1891.
Flat Head Iron....70 %
Round Head Iron....65 %
Flat Head Brass....70 %
Round Head Brass....65 %
Flat Head Bronze....70 %
Round Head Bronze....65 %
Rogers' Drive Screws....82½&5%
} Extra 10 @ 10&5 % often given.

Scroll Saws—See Saws, Scroll.

Scythes.

Grain....40&5@40&10%
Grass....40&10@50%

Scythe Snaths—See Snaths, Scythe

Sets.

Awl and Tool.

Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00....55&10%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9....25@25&10%
Miller's Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50..70&10&5%

Nail—

Square....₩ gr., $4 00@$4.25
Round....₩ gr. $3.25
Buck Bros....27½%
Cannon's Diamond Point..₩ gr.,$12, 20%

Rivet,

Regular list....50&10%

Saw—

Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, 5.25....45&50%
Common Lever ....₩ doz $2.00, 45&50%
Morrill's No. 1, $15.00; Nos. 3&4, $24.00, 40&10&50%
Leach's. .No. 0, $8.00; No. 1, $15, 15@20%
Nash's ....20&10@20&10&10
Hammer, Hotchkiss....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 30&5%
Bemis & Call Co.'s Lever and Spring Hammer....30&5%
Bemis & Call Co.'s Plate....10%
Bemis & Call Co.'s Cross Cut....12½%
Aiken's Genuine....$13.00, 50&10@60%
Aiken's Imitation....$7.00, 55&5%
Hart's Pat. Lever....20%
Disston's Star....25%
Leopold....40&10@50%
Atkin's Lever....₩ doz No. 1, $6.00
Atkin's Criterion....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00....40&10%
Avery's Saw Set and Punch....50%
Chieftain Co.'s Superior....₩ doz $7.00
Chieftain Co.'s Royal....₩ doz $7.50
Crescent....₩ doz $3.00

Sharpeners, Knife.

Parkins.

Applewood Handles....₩ doz $6.00, 40%
Rosewood or Cocobola, ₩ doz $900 40%

Shaves, Spoke

Iron....45%
Wood....
Bailey's (Stanley R. & L. Co.)....40&10%
Stearns'....30&10%
Cincinnati....35&10%
Goodell's, ₩ doz $9.00....35%

Shears—

American (Cast) Iron...75&10@75&10&5%
Barnard's Lamp Trimmers...₩ doz $3.75
Tinners'....20&2%
Seymour's, List, Dec., 1881, 60&10&10@60&10&10&5%
Heinisch's, List, Dec., 1881, 60&10&10@60&10&10&5%
Heinisch's Tailor's Shears....33⅓&5%
Cast Steel Trimmers:
First quality....30@30&10%
Second quality....30&10@30&10&10%
Acme Cast Shears....10&10%
Diamond Cast Shears....10%
Clipper....10&10%
Victor Cast Shears....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel....40%
Chicago Drop Forge & F. Co., Solid Steel Forged....60%
Davenport Cutlery Co....60@60&10%
Clauss Shear Co., Japanned....70%
Clauss Shear Co., Nickeled, same list.60%
Galvanic, 3½ to 9 in, ₩ doz, $1.00 ₩ inch

Pruning Shears and Hooks.

Disston's Combined Pruning Hook and Saw....₩ doz $18.00, 20&10%
Disston's Pruning Hook, ₩ doz $12.00, 20&10%
E. S. Lee & Co.'s Pruning Tools....40%
Pruning Shears, Henry's Pat, ₩ doz $3.75@4.00
Henry's Pruning Shears, ₩ doz $4.25@4.50
Wheeler, M. & C. Co.'s Combination, ₩ doz $12.00, 20%
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2 7.25
P. S. & W. Co....60%

Tinners', &c.—

Shears and Snips (P. S. & W.)....30@25%
Snips, J. Mallinson & Co....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888..50&10@60&5%
R. & E., list Dec. 18, 1885....55&20%
Corbin's list....60&10&2%
Patent Roller....60&10&2%
Patent Roller, Hatfield's....75%
Russell's Anti-Friction, list Dec. 18, 1885....60&2%
Moore's Anti-Friction....50%

Sliding Shutter—

R. & E. list Dec. 18, 1885....60&10&2%
Sargent's list....60&10%
Reading list....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality, 14, 16 and 20 gauge ($10 list)....30&10&2%
Prise....40&2%
Star, Club, Rival and Climax brands, 33⅓&10&2%
Selbold's Comb. Shot Shells....15&2%
Brass Shot Shells, 1st quality....60&2%
Brass Shot Shells, Club, Rival, Climax.. 65&2%

Shells Loaded—

Standard List, July 19, 1890.... 40&10&10@40&10&10&5%

Ship Tools—

L. & I. J. White....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix and Bryden's Boss, at factory....$4.00
Bryden's Frog Pressure, at factory.$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox, Wrought—

Ton lots....₩ ℔ 9¢
1000 ℔ lots....₩ ℔ 9½¢
500 ℔ lots....₩ ℔ 10¢

Shot—

	Ton lots	Small lots
Drop, up to B, 25-℔ bag	$1.30	$1.35
Drop, up to B, 5-℔ bag	.35	.35
Drop, B and larger, 25-₩ bag	1.55	1.60
Drop, B and larger 5-℔ bag	.40	.40
Buck and Chilled, 25-℔ bag	1.55	1.60
Buck and Chilled, 5-℔ bag	.40	.40
Dust Shot, 25-℔ bag	1.95	2.00
Dust Shot, 5-℔ bag	.45	.45

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885....20%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron....50&10%
Griffith's C. S....60@60&10%
Griffith's Solid C. S. R. R. Goods....20%
St. Louis Shovel Co....20@20&7½%
Hussey, Binns & Co....15@25%
Hubbard & Co....20@20&7½%
Lehigh Mfg. Co....50&10%
H. M. Myers Co....30 %
Payne Pettebone & Son....33⅓&5%
Remington's (Lowman's Pat.)30&10@40%
Rowland's, Black Iron....50&10%
Rowland's Steel....60&5@60&10%

Shovels and Tongs—

Iron Head....60&10@60&10&5%
Brass Head....60&10&10%

Sieves—

Mann's Tin Rim....50&25%
Buffalo Metallic, S. S. & Co....50&25%
Shaker (Barler's Pat.) Flour Sifters.... ₩ doz $2.00; ₩ gr $21.60
Electric....₩ gr $21.00
A. & W. Sifters....₩ doz 2.00
Hunter's....₩ doz $2.00
Smith's Adjustable Sifters....₩ doz $2.00
Smith's Adjustable Milk Strainer. ₩ doz $2.00
Smith's Adjustable T. & C. Strainer. ₩ doz. $1.25

Sieves, Wooden Rim—

	Iron.	Plated
Mesh 18, Nested, ₩ doz..	80¢	$1.00
Mesh 20, Nested, ₩ doz..	95¢	1.10
Mesh 24, Nested, ₩ doz..	$1.15	1.25

Skeins, Thimble—

Western list....75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co....60%
Seneca Falls Pattern....60%
Utica P. S. T. Skeins....60%
Utica Turned and Fitted....35%

Slates—

School, by case....50&10@50&10&10%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....65%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
E. Covert's Triumph....33⅓%

Snaths, Scythe.

L'st....50%

Soldering Irons—See Irons, Soldering.

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 6X $9.
Spittoons, Daisy, 8-inch, No. 1, $4; 10 and 11 inch, $6.

Spoke Shaves—See Shaves, Spoke.

Spoke Trimmers—See Trimmers, Spoke.

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo S. S. & Co....33⅓&2%

Silver-Plated—(4 mos. or 5% cash 30 days).

Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bro....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co...40, 15&5%
L. Boardman & Son....50&12½%

Miscellaneous.

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 80 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 49 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.
Rogers' Silver Metal....50, 10&5%
18% Rogers' German Silver....60&5%
22% Rogers' Nickel Silver....50&5%
German Silver....50@50&5
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Britannia....60@60&5%
Boardman's N'ck'l Silver, list July 1, 1891....60&7½&5%
Boardman's Britannia Spoons, case lots....60&5% cash

Springs—

Door.—

Torrey's Rod, 39 in....₩ doz $1.20@1.25
Gray's, ₩ gr., $20.00....25%
Bee Rod ₩ gr., $20.00....20@25%
Warner's No. 1, ₩ doz, $2.50; No. 2, $3.30....50&50&5%
Gem (Coil), list April 19, 1886.... 10@15%
Star (Coil), list April 19, 1886...20@20&5%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Cowell's....No. 1, ₩ doz, $13.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₩ doz, $4.50....55&10%
Hercules....50@50&10%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10&10%
Cliff's Bolster Springs....25%

Squares—

Steel and Iron....
Nickel-Plated....
} .80&10@80&10&10%
Try Square and T Bevels...60&10@60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor 50%

Squeezers.

Fodder.—

Blair's....₩ doz $2.00
Blair's "Climax"....₩ doz $1.25

Lemon—

Porcelain Lined, No. 1....₩ doz $6.00, 25&20%
Wood, No. 2....₩ doz $3.00, 35%
Wood, Common....₩ doz $1.70@1.75
Dunlap's Improved ....₩ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz....25&10%
Jennings' Star....₩ doz $2.50
The Boss....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $8.35; 3, $1.90; Queen, $2.50
Little Giant....50@50&5%
King....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass....₩ gro. $9.00
Manny Lemon Juice Extractor: Standard....₩ doz $0.75@$1 00 Improved....₩ doz $2.00

Standard Fiber Ware—See Ware, Standard Fiber.

Staples.

Blind—

Barbed, ½ in. and larger....₩ ℔ 7@7½¢
Barbed, ¾ in. ....₩ ℔ 8@8½¢
Fence Staples, Galvanized. } Same price as B'rb'd Wire
Fence Staples, Plain.... } See Trd. Rep.

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's
Waterford Goods....33⅓&40%
Butterfield's Goods....33⅓&40%
Lightning Screw Plate....30@30%
Reece's New Screw Plates....33⅓&35&40%
Reversible Ratchet....30
Gardner....35%

Stops, Bench.

Morrill's....₩ doz $9, 50%
Hotchkiss's....₩ doz $5. 10@10&10%
Weston's, No. 1, $10; No. 2, $9.25&10&5%
McGill's....₩ doz $3....15%
Cincinnati....35&10%
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60....30%

Stone—

Hindostan No. 1, 2½; Axe, 3½; Slips No. 1, 4½¢
Sand Stone....₩ ℔ 2½¢
Washita Stone, Extra....₩ ℔ 22@25¢
Washita Stone, No. 1....₩ ℔ 19@20¢
Washita Stone, No. 2....₩ ℔ 12@15¢
Washita Slips, No. 1, Extra..₩ ℔ 44@48¢
Washita Slips, No. 1....₩ ℔ 33@35¢
Arkansas Stone, No. 1, 4 to 6 in₩ ℔ $1.50
Arkansas Stone, No. 1, 6 to 9 in₩ ℔ $1.85
Turkey Oil Stone, 4 to 8 in....₩ ℔ 40¢
Turkey Slips....₩ ℔ $1.00@1.50
Lake Superior, Chase....₩ ℔ 18¢
Lake Superior Slips, Chase....₩ ℔ 20¢
Seneca Stone, Red Paper Brand....₩ ℔ 18@20¢
Seneca Stone, High Rounds..₩ ℔ 20@22¢
Seneca Stone, Small Whets..₩ gro $24.00

Stove Polish—See Polish, Stove.

Stretchers, Carpet.

Cast Steel, Polished....₩ doz $2.25
Cast Iron, Steel Points....₩ doz 90¢
Socket....₩ doz $1.70
Gullard's....25@25&10%

Strops, Razor—

Genuine Emerson....50@60&5%
Imitation " ....₩ doz $2.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....₩ doz $2.00
Lamont Combination....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89.50%
Electric....List net

Stuffers or Fillers, Sausage—

Miles' "Challenge," ₩ doz $20, 50&50&5%
Perry ....₩ doz, No. 1, $15.00; No. 0, $21.00....50&5&50&10%
Draw Cut No. 4, each $30.00....30%
Enterprise Mfg. Co....20&10@30%
Silver's....40&10%

Sweepers, Carpet.

Bissell No. 5....₩ doz $17.00
Bissell No. 7 New Drop Pan.₩ doz $19.00
Bissell, Grand....₩ doz $36.00
Grand Rapids....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₩ doz $15.00
Jewel....₩ doz $17.00
Improved Parlor Queen, Nickeled....₩ doz $27.00
Japanned....₩ doz $24.00
Excelsior....₩ doz $22.00
Garland....₩ doz $18.00
Parlor Queen....₩ doz $24.00
Housewife's Delight....₩ doz $15.00
Queen....₩ doz $16.00
Queen, with band....₩ doz $18.00
King....₩ doz $30.00
Weed, Improved....₩ doz $18.00
Hub....₩ doz $16.00
Cog-Wheel....₩ doz $16.00
Easy....₩ doz $22.00
Monarch....₩ doz $22.00
Goshen....₩ doz $21.00
Ladies' Friend....₩ doz $15.00
Advance....₩ doz $18.00
Supreme....₩ doz $22.00

Tacks, Brads, &c.—

List October 19, 1889. Old established standard Weights Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued....75 %
American, Tin'd and Cop'd.77½ %
Steel, Bright and Blued....72½ %
Steel, Tinned and Coppered 75 %
Swedes Iron, Blued....72½ %
Swedes Iron, Tinned....75 %
American Iron Tacks....72½ %
Swedes Iron Tacks—
S. S., Blued....75 %
S. S., Tinned....77½ %
Lanc., Blued....66⅔ %
Lanc., Tinned....72½ %
Gimp and Lace Tacks—
S. S., Blued....75 %
S. S., Tinned....77½ %
Lanc., Blued....66⅔ %
Lanc., Tinned....72½ %
Basket and Trimmers' Tacks—
Lanc....65 %
S. S....70 %
Hungarian Nails....66⅔ %
Miners' Tacks, S. S....75 %
Miners' Tacks, Lanc....70 %
Common and Patent Brads..66⅔ %
Leathered Tacks....20 %
Brush Tacks....50 %
Looking Glass Tacks....50 %
Picture-Frame Points....50 %
Finishing Nails....66⅔ %
Trunk and Clout Nails—
Black....62½ %
Tinned or Coppered....60% %
Basket Nails....62½ %
Chair Nails....62½ %
Cigar-Box Nails....50 %
Tin Capped Nails....50 %

Miscellaneous—

D'ble-Point..120 count85&10@85&10&10%
Double Point, 100 count....90%
Wire Carpet Nails....50&10%
Plymouth Rock Steel Carpet Tacks..25%
Wire Brads and Nails, see Nails, Wire.
Steel-Wire Brads, R. & E. Mfg. Co.'s list....50&10%

Regular discount 10&2 %, cash. On many of these goods extra 10@10&10 % is often given.

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....30@30&10%

Thimble Skeins—See Skeins.

Ties, Bale—See Standard Wire, list....50&10&5%

Tinners' Shears, &c.—See Shears Tinners'. &c

Tinware—
Stamped, Japanned and Pieced, list Jan. 20 1887.....70&10@70&25%

Tire Benders, Upsetters, &c—
See Benders and Upsetters, Tire.

Tools.
Coopers'—
Bradley's.....30@30&5%
Barton's.....20&5%
L. & I. J. White.....35%
Albertson Mfg. Co.....20%
Beatty's.....30@30&5%
Sandusky Tool Co.....30@30&5%
Shaves, Cincinnati Tool Co.....20%

Lumber.
Ring Peavies, "Blue Line"...₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies....₩ doz $19.00
Cant Hooks, "Blue Line"..₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00

Pike Poles, Pike & Hook, ₩ doz., 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft. $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00
Swamp Hooks.....₩ doz $18.00

Saw.
Atkins' Perfection.....₩ doz $12.00
Atkins' Excelsior.....₩ doz $6.00
Atkins' Giant.....₩ doz $4.00

Tobacco Cutters—See Cutters, Tobacco.

Transom Lifters—See Lifters, Transom.

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%
Mouse and Rat—
Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50, 10%
Mouse, Catch-'em-alive....₩ dz $2.50 15%
Mouse, Bonanza.....₩ doz $0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 90¢; in full cases, ₩ doz.....75¢
Hotchkiss Imp. Rat Killer..₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00

Triers—
Butter and cheese.....25%

Trimmers, Spoke.
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering, 30&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.....25%
Peace's Plastering.....25%
Clement & Maynard's.....20%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list, '32.....40%

Tubes, Boiler—
See Pipe.

Twine—

Flax Twine—	BC.	R.
No. 9, ¼ and ⅛ ℔ Balls	25¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	23¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	15¢	23¢
No. 264, Mattrass, ¼ and ⅛ ℔ Balls	52@54¢	
Chalk Line, Cotton, ⅛ ℔ Balls	25¢	
Mason Line, Linen, ⅛ ℔ Balls	55¢	
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)	15¼¢	
3-Ply Hemp, 1 ℔ Balls	16½@16¾¢	
3-Ply Hemp, 1¼ ℔ Balls	15½@15¾¢	
Cotton Wrapping, 5 Balls to ℔	15½@16¢	
2, 3, 4 and 5-Ply Jute, ⅛ ℔ Balls	10¢	
Wool	6¼@6¾¢	
Paper	13½@14¢	
Cotton Mops, 6, 9, 12 and 16 ℔ to doz.	18¢	

Vises—
Solid Box.....50&10@50&10&5%
Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....40&10%
Millers Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Sargent's.....60&10&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....30@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%
Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10%
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Sargent's.....66⅔&10%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Miscellaneous.
Combination Hand Vises.....₩ gr $42.00
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises, each.....$3.00
Massey Combination Pipe.....40%

Wads—Price per M.

U.M.C.&W. R. A.—B. E., 11 up...	68¢	Dis. 20&2
U.M.C.&W. R. A.—B. E., 9&10...	82¢	
U.M.C.&W. R. A.—B. E., 8.....	96¢	
U.M.C.& W.R.A.—B. E., 7.....	$1.10	
U.M.C.&W. R. A.—P. E., 11 up..	1.15	
U.M.C.&W. R. A.—P. E., 9&10..	1.50	
U.M.C.&W. R. A.—P. E., 8.....	1.70	
U.M.C.&W.R.A.—P. E., 7.....	1.80	
Eley's B. E., 11 up.....	$1.70@$1.75	
Eley's P. E., 11@30.....	3.00@ 3.25	

Wagon Boxes—See Boxes, Wagon.

Washer Cutters—See Cutters Washer.

Wagon Jacks—See Jacks, Wagon.

Ware, Hollow, Enameled, &c.
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10%
Unground.....80&10&10%
White Enameled-Ware—
Maslin Kettles.....75@75&5%
Boilers and Saucepans.....50&10@60%
Tinned Boilers and S'pans....50&10@60%
Rustless Hollow-Ware.....50@50&5%
Gray Enameled-Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%
Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware...dis 33⅓&10%
Kettles—
Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢		75¢

Standard Fiber—

	Per Dozen. Plain.	Dec'r'd
Wash-Basins, 10½ in.....	$2.00	$2.25
Wash-Basins, 12 in.....	2.25	2.75
Keelers, 11½ in.....		4.00
Cuspidors.....		3.00
Spittoons, "Daisy," 8 in....	4.00	4.50
Peck Measure.....	4.00	
Half-peck Measure.....	3.50	

See also *Pails.*
Indurated Fiber—25%
Spittoons, No. 2, ₩ doz.....$3.40
Basins, Ringed, ₩ doz., No. 2.....$3.00
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$7.50
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.00
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.70
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces) ₩ set.....$1.60
See also *Pails.*
Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton..... } 40&5%
Meriden Britannia Co..... }
Simpson, Hall, Miller & Co..... }
Rogers & Brother..... }
Hartford Silver Plate Co..... } 40&5&5%
William Rogers Mfg. Co..... }

Washers—

Size hole.....	5-16	⅜	½	⅝ to 1¾
Washers.....	6	5	3.50¢	3

In lots less than 200 ℔, ₩ ℔, add ¼¢, 5-℔ boxes 1¢ to list.

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—
Solid Eyes.....₩ ton $15@$19

Well Buckets, Galvanized—See Buckets, Well, Galvanized.

Wheels, Well.
8 in., $2.25; 10 in., $2.70; 12 in., $3.20

Wire and Wire Goods—
Iron—
Market.
Br. & Ann., Nos. 0 to 18.....77½%
Cop'd, Nos. 0 to 18.....75%
Galv., Nos. 0 to 18.....67½%
Tin'd, Tinned list Nos. 0 to 18.....67½%
Stone.
Br. and Ann'd, Nos. 16 to 18.....77½%
Bright and Ann'd, Nos. 19 to 26.....80%
Br. and Ann'd, Nos. 27 to 36.....82½%
Tinned.....
Tinned Broom Wire .18 to 21, ¢ ℔.....8¢
Galvanized Fence, Nos. 8 and 9.....70%
Brass, list Jan. 18, 1884.....35%
Copper, list Jan. 18, 1884.....35%
Annealed Wire on Spools.....60%
Malin's Steel and Tin'd on Spools.....60%
Malin's Brass and Cop. on Spools.....50%
Tate's Spooled, Tinned and Annealed.55%
Tate's Spooled Cop. and Brass.....45%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, 12 to 30...60@70¢ ₩ ℔
Wire Clothes Lines, see Lines.
Wire Picture Cord see cord.

Bright Wire Goods—
Standard list.....25%

Wire Cloth and Netting.
Painted Screen Cloth, good quality ₩ 100 sq. ft., $1.40
Galvanized Wire Netting.....70&10@75%

Wire, Barb.—Prices unsettled. See Trade Report.

Wire Rope—See Rope, Wire.

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....40&10@50%
Coes' Genuine.....50&5%
Coes' "Mechanics'".....50&10&5%
Girard Standard.....55&10%
Lamson & Sessions' Engineers'..60&10%
Lamson & Sessions' Standard....70&10%
P. S. & W. Agricultural..... } 75&10@
Girard Agricultural..... } 70&10&5%
Lamson & Sessions' Agric'l.. }
Bemis & Call's
Pat. Combination.....35%
Merrick's Pattern.....35%
Brigg's Pattern.....25%
Cylinder or Gas Pipe.....40&5%
No. 3 Pipe.....40&10%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....20&10%
Always Ready.....35&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—
Am. Wringer Co.'s list, July 15, 91..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg Co., list Jan 1, 1892..2 % cash
Peerless Mfg. Co, list Feb., 1892..2%cash

Wrought Goods
Staples, Hooks, &c., list Jan. 12, 1886, 35@35&5

PAINTS, OILS AND COLORS.—Wholesale Prices.

Animal and Vegetable Oils.

Linseed, City, raw..per gal.	37	@	..
Linseed, City, boiled.....	40	@	..
Linseed, Western, raw.....	35	@	..
Lard, City, Extra Winter..	56	@	57
Lard, City, Prime.....	57	@	58
Lard, City, Extra No. 1.....	44	@	45
Lard, City, No. 1.....	40	@	42
Lard, Western, prime.....	56	@	57
Cotton-seed, Crude, prime.	25	@	25¼
Cotton-seed, Crude, off grades.....	22½@		23½
Cotton-seed, Summer Yellow, prime.....	29	@	29½
Cotton-seed, Summer Yellow, off grades.....	27½@		28¼
Sperm, Crude.....	70	@	71
Sperm, Natural Spring.....	67	@	70
Sperm, Bleached Spring....	72	@	75
Sperm, Natural Winter.....	73	@	76
Sperm, Bleached Winter...	78	@	81
Whale, Crude.....	..	@	45
Whale, Natural Winter.....	54	@	55
Whale, Bleached Winter...	57	@	58
Whale, Extra Bleached.....	59	@	60
Sea Elephant, Bleached Winter.....	62	@	63
Menhaden, Crude, Sound...	30	@	32
Menhaden, Crude, Southern	..	@	..
Menhaden, Light Pressed..	37	@	38
Menhaden, Bleached W'ter.	38	@	39
Menhaden, Extra Bleached	40	@	42
Tallow, City, prime.....	44	@	45
Tallow, Western, prime....	42½@		43
Cocoanut, Ceylon.....	5½@		6¾
Cocoanut, Cochin.....	6½@		6¾
Cod, Domestic.....	38	@	40
Cod, Foreign.....	42	@	44
Red Elaine.....	34	@	36
Red Saponified.....	4½@		5
Rank.....per gal	35	@	36
Straits.....	36	@	37
Olive, Italian, bbls.....	60	@	63
Neatsfoot, prime.....	55	@	65
Palm, prime, Lagos....₩ ℔	6	@	6½

Mineral Oils.

Black, 29 gravity, 25 @ 30 cold test.....per gal	7	@	7½
Black, 29 gravity, 15 cold test.....	8	@	8½
Black, 29 gravity, summer.	6	@	6½
Cylinder light, filtered.....	15	@	
Cylinder, dark, filtered....	12	@	15
Paraffine, 23½ @ 24 gravity.	13½@		14
Paraffine, 25 gravity.....	12½@		13
Paraffine, 28 gravity.....	8	@	·½
Paraffine, red, 23½@24 gr'ty	13	@	15

Paints and Colors.

Barytes, Foreign, ₩ ton.	$22.00	@	24.00
Barytes, Amer. floated...	30.00	@	32.00
Barytes, Amer. No. 1....	19.00	@	20.00
Barytes, Amer. No. 2....	13.00	@	16.00
Barytes, Amer., No. 3....	11.00	@	12.00
Blue, Celestial.....₩ ℔	6	@	8
Blue, Chinese.....	40	@	50
Blue Prussian.....	25	@	40
Blue, Ultramarine.....	8	@	25
Brown, Spanish.....	½@		1
Brown, Vandyke, Amer..	3	@	3½
Brown, Vandyke, English	6	@	8
Carmine, No. 40, in bulk.	3.10	@	..
Carmine, No. 40, in boxes or barrels.....	3.20	@	..
Carmine, No. 40, in ounce bottles.....	4.20	@	..
Chalk, in bulk.....₩ ton.	2.00	@	.05
Chalk, in bbls..₩ 100 ℔.	.33	@	.40
China Clay, English.... ₩ ton.	18.00	@	18.00
Cobalt Oxide, prep'd....	9.00	@	11.00
Cobalt Oxide, black..... lots 100 ℔.	2.50	@	....
Cobalt, Oxide, black..... less 100 ℔.	2.65	@	2.90
Green, Paris, in bulk.....	14	@	15¼
Green Paris, 170 @ 175 ℔ Kegs.....	14½@		15¾
Green, Paris, small pack.	16	@	21¾
Green, Chrome, ordinary	6	@	12
Green, Chrome, pure....	22	@	25
Lead, Eng., B.B. white....	8¾@		10
Lead, Amn. White, dry or in oil: Kegs, lots less than 500 ℔...	7¼	@	7½
Kegs, lots 500 ℔ to 5 tons....	6¾	@	7
Kegs, lots 5 tons to 12 tons..	6½	@	6¾
Kegs, lots 12 tons and over..	6¼	@	6½
Lead White in oil 25 ℔ tin pails add to keg price.....		@	¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price		@	..
Lead, White, in oil, 1 to 5 ℔ assorted tins, add to keg price		@	2½
Lead, Red, bbls. and ½ bbls....	6¾	@	7¼
Lead, Red, kegs.....	6¾	@	7¼
Litharge, kegs.....	6½	@	7½
Litharge, bbls. and ½ bbls.	6¾	@	7¼

TERMS, &c.—Lead and Litharge.—On lots of 500 ℔ or over, 60 days' time or 2½ % discount for cash if paid within 15 days of date of invoice.

Ocher, Rochelle.....	1.35	@	1½
Ocher, French Washed.....	1½@		2½
Ocher, German Washed...	1½@		3
Ocher, American.....	½@		1½
Orange Mineral, English..	8½@		9
Orange Mineral, French....	10	@	10½
Orange Mineral, German ..	8½@		09
Orange Mineral, American.	8	@	8½
Paris White, English Cliff-stone.....	1.00	@	1.15
Paris White, American.....	70	@	75
Red, Indian, English.....	5½@		7
Red, Indian, American.....	2	@	6½
Red, Turkey.....	9	@	14
Red, Tuscan	9	@	11
Red, Venetian, American.. ₩ 100 ℔.	1.00	@	1.25
Red, Venetian, English....	1.00	@	1.50
Sienna, Italian, Burnt and Powd.₩ ℔	4	@	5
Sienna, Ital., Burnt Lumps	1½@		3½
Sienna, Ital., Raw, Powd..	4½@		5½
Sienna, Ital., Raw Lumps..	1½@		3½
Sienna, American, Raw....	1½@		1¾
Sienna, American, Burnt and Powdered.....	1½@		1¾
Talc, French.....	1½@		1½
Talc, American.....	1	@	1¼
Terra Alba, Fr'ch. ₩ 100 ℔	75	@	80
Terra Alba, English	80	@	90
Terra Alba, American No. 1	70	@	75
Terra Alba, American No. 2	45	@	50
Umber, Turkey, Bnt. and Powd.,..... ₩ ℔	3½@		4
Umber, Turkey Bnt. Ln	2½@		3
Umber, Turkey, Raw and Powdered.....	3½@		
Umber, Turkey, R'w Lmps	2½@		2¾
Umber, Turkey, Bnt. Amer.	1½@		1¾
Umber, Turkey, R'w Amer.	1½@		1¾
Yellow, Chrome.....	10	@	25
Vermilion Americ. Lead..	11½@		17
Vermilion, Quicks'er, bulk.	60	@	62
Vermilion, Quicks'er, bags.	61	@	63
Vermilion Quicksilver, smaller pkgs.....	65	@	67
Vermilion English Import	85	@	90
Vermilion, Imitation, Eng.	8	@	25
Vermilion, Trieste.....	90	@	92½
Vermilion, Chinese.....	92½@		95
Whiting, Common. ₩ 100 ℔	40	@	45
Whiting, Gilders'.....	55	@	65
Zinc, American, dry....₩ ℔	4½@		5
Zinc, French, Red Seal....	..	@	8½
Zinc, French, Green Seal..	..	@	8½
Zinc, French, V. M. X.....	..	@	7
Zinc, Antwerp, Red Seal...	..	@	7½
Zinc, Antwerp, Green Seal	..	@	8½
Zinc, German, L. Z. O....	..	@	6½
Zinc, V M. in Poppy Oil, G. Seal, lots of 1 ton and over.....	10½@		11¼
lots less than 1 ton	11	@	11½
Zinc, V. M. in Poppy Oil, Red Seal.....	..	@	..
lots of 1 ton and over....	10	@	10¼
Lots of less than 1 ton....	10½@		10¾

DISCOUNTS.—French Zinc.—Discounts to buyers of 10- bbl. lots of one or assorted grades, 1 %; 25 bbls, 2 %, 50 bbls, 4 %. No discount allowed on less than bbl. lots.

Colors in Oil.

Black, Drop, Frankfort....	25	@	30
Black, Dro., English	12	@	15
Black, Drop, Dom stic	7	@	10
Black, Lampblack, Best....	20	@	35
Black, Lampblack, Common	7	@	18
Black, Ivory.....	8	@	15
Blue, Chinese.....	35	@	40
Blue, Prussian.....	29	@	45
Blue, Ultramar.ine.....	12	@	18
Brown, Vandyke.....	7	@	12
Green, Chrome.....	8	@	13
Green, Paris.....	16	@	18½
Sienna, Raw.....	7	@	14
Sienna, Burnt.....	7	@	14
Umber Raw.....	7	@	10
Umber, Burnt	7	@	10

Putty.

In barrels and ½ bbls....	.01¾@		.01¾
In tubs.....	.01¾@		.01¾
In tin cans.....	.01¾@		.02¼
In bladders.....	.01¾@		.02¼

Spirits Turpentine.

In regular bbls.....	38½@		....
In machine bbls.....	39	@	....

Glue.

Low Grade.....₩ ℔	8	@	10
Cabinet.....	12	@	14
Medium White.....	13	@	15
Extra White.....	17	@	20
French.....	18	@	22
English.....	10	@	15
Irish.....	12	@	..

CURRENT METAL PRICES.

FEBRUARY 24, 1892.

The following quotations are for small lots. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market reports.

IRON AND STEEL.

Bar Iron from Store.

Common Iron:	
¾ to 2 in. round and square.. 1 to 6 in. x ⅝ to 1 in....	₩ ℔ 1.90 @ 2.00¢
Refined Iron:	
¾ to 2 in. round and square. 1 to 4 in. x ⅜ to 1½ in.... 4½ to 6 in. x ⅜ to 1 in.	₩ ℔ 2.00 @ 2.20¢
1 to 6 in. x ¼ and 5-16	₩ ℔ 2.20 @ 2.40¢
Rods—¾ and 11-16 round and sq.	₩ ℔ 2.10 @ 2.30¢
Bands—1 to 6 x 3-16 to No. 12	₩ ℔ 2.30 @ 2.50¢
"Burden Best" Iron, base price	₩ ℔ 3.00¢
Burden's "H. B. & S." Iron, base price	₩ ℔ 2.80¢
"Ulster"	₩ ℔ 3.00¢
Norway Bars	3.75 @ 4.00¢
Norway Shapes	4.50 @ 5.00¢

Merchant Steel from Store.

	Per pound
Open-Hearth and Bessemer Machinery, Toe Calk, Tire and Sleigh Shoe, base price in small lots	2¾¢
Best Cast Steel, base price in small lots.	8 ¢
Best Cast Steel Machinery, base price in small lots	5 ¢

Sheet Iron from Store.

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔ 3 @	3½¢
17 to 20	₩ ℔ 3⅛ @	3⅝¢
21 to 24	₩ ℔ 3¼ @	3⅝¢
25 and 26	₩ ℔ 3⅜ @	3¾¢
27	₩ ℔ 3½ @	3⅞¢
28	₩ ℔ 3⅝ @	4 ¢
American B. B.	₩ ℔ 4¢ @ 4½¢	

Galvanized Sheet Iron.

	B. B.	2d qual.
Nos. 10 to 16	₩ ℔ 4.20¢	4 ¢
17 to 22	₩ ℔ 4.60¢	4.30¢
23 to 24	₩ ℔ 4.90¢	4.70¢
25 to 26	₩ ℔ 5.30¢	5 ¢
27	₩ ℔ 5.60¢	5.30¢
28	₩ ℔ 6 ¢	5.70¢
29 to 30	₩ ℔ 7 ¢	6.70¢
Genuine Russia, according to assortment	₩ ℔ 11½¢ @ 11½¢	
Patent Planished	₩ ℔ A, 10¢; B, 9¢	
Craig Polished Sheet Steel	₩ ℔, 8½¢	

English Steel from Store.

Best Cast	₩ ℔ 15 ¢
Extra Cast	₩ ℔ 16½ @ 17 ¢
Swaged. Cast	₩ ℔ 16 ¢
Best Double Shear	₩ ℔ 15 ¢
Blister, 1st quality	₩ ℔ 12 ¢
German Steel, Best	₩ ℔ 10 ¢
2d quality	₩ ℔ 9 ¢
3d quality	₩ ℔ 8 ¢
Sheet Cast Steel, 1st quality	₩ ℔ 15 ¢
2d quality	₩ ℔ 14 ¢
3d quality	₩ ℔ 12½¢
R. Mushet's "Special"	₩ ℔ 48 ¢
" " "Titanic"	₩ ℔ 20 ¢

METALS.

Tin.

	Per ℔
Banca, Pigs	22 @ ..¢
Straits, Pigs	21 @21½¢
Straits in Bars	23 ¢

Tin Plates.

Duty: 2.2 cents per pound.

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

			Per box.
Melyn and Calland Grade	IC, 10 x14	@	$6.50
" " "	IC, 12 x12	@	6.75
" " "	IC, 14 x20	@	6.50
" " "	IC, 20 x28	@	13.00
" " "	IX, 10 x14	@	8.50
" " "	IX, 12 x12	@	8.75
" " "	IX, 14 x20	@	8.50
" " "	IX, 20 x28	@	17.00
" " "	DC, 12½x17	@	6.00
" " "	DX 12½x17	@	8.00
Allaway Grade	IC, 10 x14	@	6.00
" "	IC, 12 x12	@	6.25
" "	IC, 14 x20	@	6.00
" "	IC, 20 x28	@	12.00
" "	IX, 10 x14	@	7.50
" "	IX, 12 x12	@	7.75
" "	IX, 14 x20	@	7.50
" "	IX, 20 x28	@	15.00
" "	DC, 12½x17	@	5.50
" "	DX, 12½x17	@	7.00

Coke Plates.—Bright.

Steel Coke.—IC, 10 x 14, 14 x 20	@	$5.70
10 x 20	@	8.50
20 x 28	@	11.50
IX, 10 x 14, 14 x 20	@	12.00
BV Grade.—IC, 10 x 14, 14 x 20	@	7.00
	@	5.75

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Dean Grade.—IC, 14 x 20	@	$5.75
20 x 28	@	11.00
IX, 14 x 20	@	6.50
20 x 28	@	13.00
Abecarne Grade.—IC, 14 x 20	@	5 65
20 x 28	@	11 00
IX 14 x 20	@	6 50
20 x 28	@	13 00

Tin Boiler Plates.

IXX, 14 x 28	112 sheets	@ $13.35
IXX, 14 x 28	112 sheets	@ 14 50
IXX, 14 x 31	112 sheets	@ 16 00

Copper.

Duty: Pig, Bar and Ingot, 1½¢; Old Copper, 1¢ ₩ ℔. Manufactured (including all articles of which Copper is a component of chief value), 35 % ad valorem.

Ingot

Lake	@ 11½¢
Ansonia Grade Arizona	@ 11 ¢
Ansonia Grade Casting	@ 10¾¢

Sheet and Bolt.

Prices adopted by the Association of Copper Manufacturers of the United States, December 5, 1890. Subject to a discount of 10 % @ 20 %, according to size of order.

Not wider than	Not longer than	And longer than	Weights per square foot and prices per pound. Over 64 oz.	32 to 64 oz.	16 to 32 oz.	14 to 16 oz.	12 to 14 oz.	10 to 12 oz.	8 to 10 oz.	Less than 8 oz.
30	72		22	22	22	23	24	25	28	30
90		72	22	22	22	23	25	27	31	...
36	96		22	22	22	24	26	30	33	....
36		96	22	22	23	25	27	31	35	....
48	96		22	22	24	26	28	32	....	....
48		96	22	22	25	27	29	33	....	....
60	96		22	22	27	29	34	....	....	....
60		96	22	23	28	....	....	....	....	....
84	96		23	24	....	....	....	....	....	....
84		96	24	25	....	....	....	....	....	....
Over 84 in. wide			25	27	....	....	....	....	....	....

Bolt Copper, ½ inch diameter and over, per pound ..... 22¢

Circles, 60 inches in diameter and less, 3 cents per pound advance over lowest prices of Sheet Copper of the same thickness.

Cold or Hard Rolled Copper 14 oz. ₩ square foot and heavier, 1¢ ₩ ℔ over the foregoing prices.

Cold or Hard Rolled Copper lighter than 14 oz. ₩ square foot, 2¢ ₩ ℔ over the foregoing prices.

Copper Bottoms, Pits and Plates.

	Per pound
14 ounce to square foot and heavier	26¢
12 ounce and up to 14 ounce to square foot	27¢
10 ounce and up to 12 ounce	29¢
Lighter than 10 ounce	32¢

Circles less than 8 inches diameter 2 cents per pound additional.

Circles over 13 inches diameter are not classed as Copper Bottoms.

10 % discount.

Copper Wash Bowl Bottoms.

Tinned ..... ₩ ℔ 34¢, 10%

Net.

Tinning sheets on one side, 10, 12 and 14 x 48 each	8¢
Tinning sheets on one side, 30 x 60 each	30¢
For tinning boiler sizes, 9 in. (sheets 14 in. x 60 in.), each	15¢
For tinning boiler sizes, 8 in. (sheets 14 in. x 56 in.), each	12¢
For tinning boiler sizes, 7 in. (sheets 14 in. x 52 in.) each	12¢
Tinning sheets on one side, other sizes, per square foot	2½¢
For tinning both sides double the above prices.	

Planished Brass and Copper.

Not larger than 30 x 60.

16 oz. and heavier	24¢ ₩ ℔
14 oz	25¢ ₩ ℔
12 oz	27¢ ₩ ℔

Seamless Brass Tubes.

Net.

Dec. 16, 1891.

O. G.	N. G.	⅜	¼	⅝	½	¾	1	1¼
8-14	6-12	30	26	23	22	21	20	17
15	13	31	26	24	23	22	21	18
16	14	32	27	25	24	23	22	18
17	15	33	28	26	23	24	23	19
18	16	35	29	27	25	24	23	20
19	17	36	30	28	27	26	25	22
20	18-19	37	32	30	29	28	27	24
21	20	39	34	32	31	30	29	27
22	21	41	35	34	32	31	30	29
23	22	43	37	35	34	33	32	32
24	23	46	39	37	36	34	33	34
25	24	49	42	39	38	37	36	38

Copper Tubes, 3¢ ₩ ℔ additional.

Copper Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing. (To No. 20, inclusive.

Above 5-16 inch to 3 inch, inclusive	36¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	1.50
Fancy Tubing, Brass, to No. 20, inclusive	45¢ ₩ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass.	
Discount from list	30 @ ..%

Roll and Sheet Brass.

(Brown & Sharpe Standard Gauge.)

Common High Brass: Wider than and including	in. 2	in. 10	in. 12	in. 14	in. 16	in. 18	in. 20	in. 22	in. 24
To No. 20, inclusive	.21	.22	.23	.25	.27	.29	.31	.33	
Nos. 21, 22, 23 and 24	.22	.23	.24	.26	.28	.30	.32	.34	
Nos. 25 and 26	.22½	.23½	.24½	.27	.29	.31	.33	.35	
Nos. 27 and 28	.23	.24	.25	.28	.30	.32	.34	.36	

Common High Brass: Wider than and including	in. 24	in. 26	in. 28	in. 30	in. 32	in. 34	in. 36	in. 38	in. 40
To No. 20, inclusive	.36	.39	.42	.46	.50	.55	.60	.65	
Nos. 21, 22, 23 and 24	.37	.40	.43	.47	.51	.56	.61	.66	
Nos. 25 and 26	.38	.41	.44	.48	.52	.57	.63	.71	
Nos. 27 and 28	.39	.42	.45	.49	.53	.58	.65	.75	

Discount from list 10 % @ 25 %.

Brass and Copper Wire.

List January 17, 1884.

Numbered by Stubs' gauge.	Soft & hard high brass.	Spring high brass.	Low brass.	Copper.
All Nos. to No. 16, inclusive	$0.22	$0.24	$0 26	$0.30
No. 17 and No. 18	.23	.25	.27	.31
No. 19 " " 20	.24	.26	.28	.32
No. 21, or 0.032 diam	.25	.27	.29	.33

Discount 10 % to 25 %.

Fine Numbers.

Numbered by London gauge.	Brass.	Spring high brass.	Low brass.	Copper.
No. 22	$0.26	$0.28	$0.30	$0 34
No. 23	.28	.30	.32	.36
No. 24	.30	.32	.34	.38
No. 25	.32	.34	.36	.40
No. 26	.35	.37	.39	.43
No. 27	.38	.40	.42	.46
No. 28	.42	.44	.46	.51
No. 29	.45	.47	.49	.54
No. 30	.48	.50	.52	.62
No. 31	.51	.53	.55	.67
No. 32	.55	.57	.59	.73
No. 33	.59	.61	.63	.82
No. 34	.64	.66	.68	.96
No. 35	.70	.72	.74	1.30
No. 36	.76	.78	.80	1.50
No. 37	1.00	1.02	1.04	1.70
No. 38	1.30	1.32	1.34	2.00
No. 39	2.00	2.02	2.00	3.25
No. 40	2.60	2.62	2.60	5.75

— % discount.

Spring Wire, 2¢ ₩ ℔ advance.

Copper Belt and Hose Rivets and Burrs.

Per ℔.		Per ℔.
No. 5	49¢	No. 11 56¢
No. 6	49¢	No. 12 58¢
No. 7	49¢	No. 13 60¢
No. 8	50¢	No. 14 66¢
No. 9	52¢	No 15 70¢
No 10	54¢	

60 % @ 10 % discount.

Tobin Bronze—Rods.

Drawn Rods for Bolts, Forgings, &c.

¼ to ⅜ inch inclusive	17¢ ₩ ℔
Over ⅜ to 3½ inches inclusive	16¢ ₩ ℔
Over 3½ to 5 inches inclusive	17¢ ₩ ℔

Piston Rods, Finished True, Smooth and Straight.

¼ to ⅜ inch inclusive	18¢ ₩ ℔
Over ⅜ to 2 inches inclusive	17¢ ₩ ℔
Over 2 to 3½ inches inclusive	18¢ ₩ ℔
Over 3½ to 5 inches inclusive	19¢ ₩ ℔

Spelter.

Duty: Pig, Bars and Plates, $1.50 ₩ 100 ℔.

Western Spelter	5½¢
Bertha (pure)	5¾¢

Zinc.

Duty; Sheet, 2½¢ ₩ ℔.

600 ℔ casks	7¼¢
Per ℔	7½¢

Lead.

Duty: Pig, $2 ₩ 100 ℔. Old Lead, 2¢ ₩ ℔. Pig and Sheets 2½¢ ₩ ℔.

American Pig	4½¢
Bar	5½¢
Pipe, subject to discount 20 %	6½¢
Tin-Lined Pipe, subject to discount 20 %	15¢
Block Tin Pipes, subject to discount 20 %	37½¢
Sheet, subject to discount 20 %	7¢

Old Lead in exchange, 3½¢ ₩ ℔.

Solder.

½ @ ½ (Guaranteed)	11¢
No. 1	11½¢
Extra Wiping	11¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony.

Cookson	₩ ℔ 16 @ 1 6½¢
Hallett's	" .... @ 13½¢

ALUMINUM.

Prices Per Ton.

Duty: 15 cents per pound.

Over 98 % pure	₩ ℔ .75
94 % @ 98 % pure	₩ ℔ .65

Old Metals.

Prices Paid in New York.

Heavy Copper	₩ ℔ 10 ¢
Light Copper	₩ ℔ 9 ¢
Heavy Brass	₩ ℔ 7 ¢
Light Brass	₩ ℔ 6 ¢
Lead	₩ ℔ 3½¢
Tea Lead	₩ ℔ 3½¢
Zinc	₩ ℔ 2½¢
No. 1 Pewter	₩ ℔ 14 ¢
No 2 Pewter	₩ ℔ 7 ¢
Wrought Scrap Iron	₩ gross ton $17.00
Heavy Cast Scrap	₩ gross ton 10.00
Stove Plate Scrap	₩ gross ton 7.00
Burnt Iron	₩ gross ton 5.00